1982 ANNUAL REPORT

FIELD SERVICES IN EUROPE

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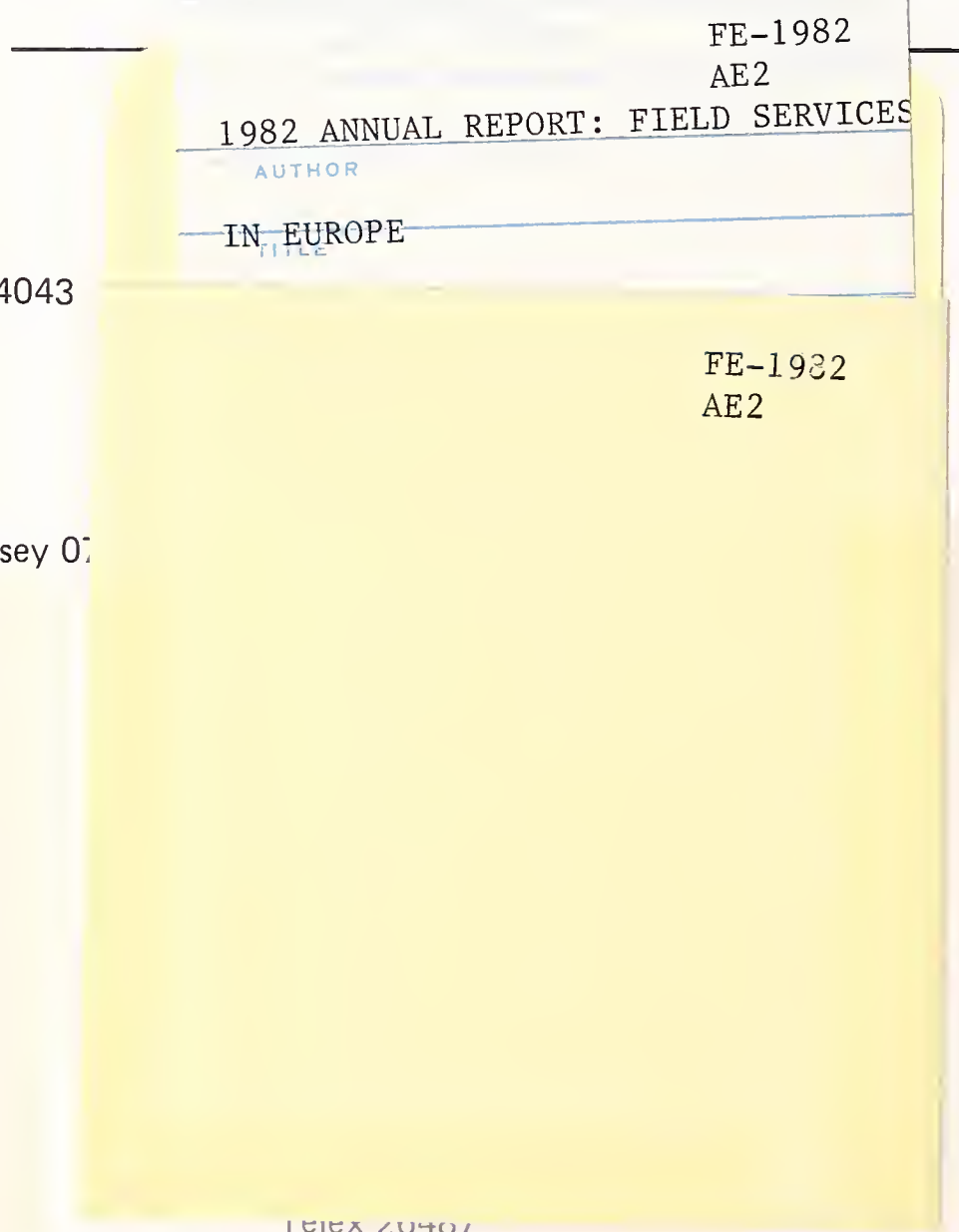Telex 171407

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1982 ANNUAL REPORT

FIELD SERVICES IN EUROPE

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I INTRODUCTION

I INTRODUCTION

- This 1982 Field Service Annual Report is the third annual report in INPUT's European Field Service Programme. It is designed to provide planning data for field service executives and presents a comprehensive picture of the information processing maintenance industry.

- Users, as well as vendors, were canvassed to provide the information analysed herein.

  - The 1982 annual report places a greater emphasis on user opinions about service than did previous reports owing to users' increasing awareness of and control over maintenance plans and options.

  - A broad range of vendors was surveyed, including maintainers of mainframe computers, small business systems, minicomputers, micro-computers, peripherals, terminals, word processors, and data communications equipment.

  - Manufacturers' service organisations and third-party maintenance firms were interviewed.

- Telephone and mail interviews were conducted using the questionnaire included as Appendix E. Secondary research included INPUT's library of vendor and market information.

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- Data have been organised and analysed by European regions and also as a single market.

  - Regional field service data bases have been established for the following markets:

    . The United Kingdom (Appendix A).

    . West Germany (Appendix B).

    . France (Appendix C).

    . Benelux/Scandinavia/Italy (Appendix D).

  - This information, in turn, is assessed in plenary form for an overview of the entire European market.

- The 1982 European Field Service Annual Report comprises three major sections.

  - The Executive Summary, Chapter II, provides an overview of important industry parameters including revenue, cost, customer satisfaction, issues, trends, and strategies. It also gives specific recommendations based on the researched conclusions.

  - Chapter III discusses key maintenance issues viewed by users of information processing equipment, including:

    . An evaluation of vendors' maintenance service and system availability.

    . Vendors' response and repair times and failure cycles.

    . Attitudes, grievances, and priorities concerning vendor service.

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- Market segmentation.

- Chapter IV describes vendors' opinions of themselves regarding the business of service. Subsections address the following vendor parameters:

    - Maintenance pricing and revenue.

    - Management, including personnel practices and statistics, and measurement techniques.

    - New ideas.

    - Operations (repair and response times).

    - Marketing field service.

- Research for the 1982 European Field Service Annual Report was based on the following user and vendor samples:

    - One hundred thirty-three (133) users replied to the field service questionnaire from a randomly selected list of users.

    - Fifteen (15) vendor interviews were conducted.

    - Exhibits I-I and I-2 show the breakdown of user and vendor respondents, respectively.

    - INPUT believes that these interviews represent an accurate account of European field service business conditions.

- The report continues INPUT's research and analysis in the area of field service, initiated in INPUT's 1978 U.S. multiclient study, Maintenance Requirements for the Information Processing Industry.

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EXHIBIT I-1

NUMBER OF USER RESPONDENTS BY CELLS

NUMBER OF RESPONDENTS BY COUNTRY	
U.K.	57
France & Italy	17
Germany	24
Benelux	19
Scandinavia	16

SIZES OF RESPON- DENT FIRMS (Number of Employees)	
0 - 50	7
51 - 100	8
101 - 200	16
201 - 500	38
Over 500	64

NUMBER OF RESPONDENT SYSTEMS/UNITS	
IBM	92
Honeywell	54
Burroughs	10
Univac	7
NCR	9
ICL	30
DEC	13
Siemens	15
Others*	71

RESPONDENTS BY TYPE OF SYSTEMS/ UNITS USED	
Large Systems	30
Medium Systems	60
Small Systems	31
Minis & Micros	28
Peripherals	55
Terminals	63
Word Processing	15

*CDC-3 Rediffusion-2 BASF-4 Memorex-4 STC-2 PET-1 NAS-3 NEC-1
Amdahl-1 Ferranti-1 ITT-4 Datasaab-4 Lexitron-1 TI-1 MOS-2 Datapoint-1
Prime-3 Hewlett-Packard-2 Olivetti-2 Racal-1 Wang-5 Ericsson-1 OKI-1 PCP-1
Harris-1 Vector-1 Raytheon-2 Nixdorf-3 Metric-1 CPT-2 Transac-2 CMC-1
Data General-1 Wordplex-11 General Automation-1

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EXHIBIT I-2

VENDOR RESPONDENTS

VENDOR	TYPE OF VENDOR	SIZE OF COMPANY*	AREA OF OPERATION	PRODUCTS MAINTAINED
1	Manufacturer	Small	U.K.	Data Communications
2	Manufacturer	Medium	U.K.	Peripherals
3	Third-Party Maintenance	Small	Holland	Minicomputers
4	Manufacturer	Large	Europe	Peripherals, Terminals, Data Communications
5	Distributor	Small	U.K.	Microcomputers
6	Manufacturer	Medium	U.K.	Data Communications
7	Manufacturer	Large	Europe	Large Systems, Medium Systems, Small Systems
8	Manufacturer	Large	U.K.	Peripherals, Terminals, Data Communications
9	Third-Party Maintenance	Medium	U.K.	Medium, Small, Minicomputer Systems; Microcomputers, Peripherals, Terminals, Word Processors, Work Stations, and Data Communications
10	Manufacturer	Large	U.K.	Large, Medium, Small, Microcomputer, and Minicomputer Systems, Peripherals, Terminals, Word Processors, Work Stations, and Data Communications
11	Distributor/ Third-Party Maintenance	Small	U.K.	Small Minicomputer, Microcomputer Systems, Peripherals, Terminals, Word Processors, and Data Communications
12	Manufacturer	Medium	U.K.	Minicomputers
13	Manufacturer	Small	Italy	Medium Systems
14	Manufacturer	Medium	Europe	Small Systems
15	Manufacturer	Medium	U.K.	Large Systems

*Size based on number of field service personnel:
Small = Less than 50; Medium = 51 to 200; Large = Over 200

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- The overall methodology is described in Exhibit I-3.

• Inquiries and comments from clients are invited, regarding both the context of this report and related topics of further interest.

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EXHIBIT I-3

METHODOLOGY USED IN THE FIELD SERVICE PROGRAMME

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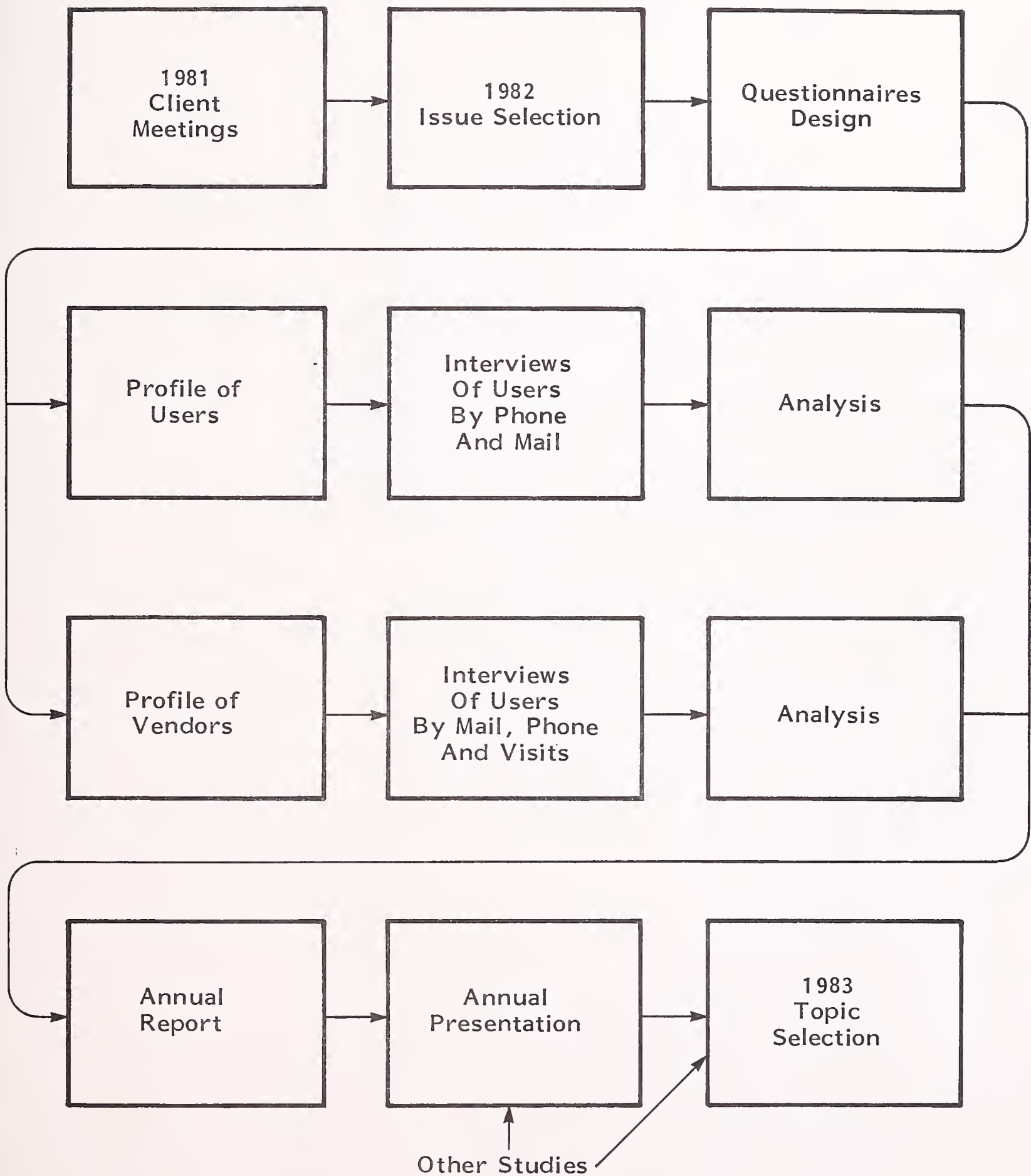
II EXECUTIVE SUMMARY

II EXECUTIVE SUMMARY

A. CONCLUSIONS

1. THE INFORMATION TECHNOLOGY MARKETPLACE, 1982

- Despite very severe worldwide economic woes which have lingered throughout 1982, the demand for information processing equipment has been healthy in Western European markets and is expected to continue at a 20% annual growth rate.

    - The growth rate for equipment is expected to exceed that for maintenance because of the increase in microcomputers, which dilute maintenance revenues.

    - High interest rates which helped to curb inflation, but at the same time create unemployment, began to subside.

    - This stimulated capital spending at a rate to sustain demand for information processing equipment and services.

    - The West German market continues to be most successful while the French market is strained because of political pressures and devaluation of the franc.

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- The markets in the United Kingdom and Italy have maintained strength established in 1980 and are expected to continue healthy expansion.

• Market metamorphosis was accelerated in 1982 because of the proliferation in microcomputer-based technology and products.

- Office automation, and medium and small systems are beginning to replace large mainframes and systems.

- Personal computers will overtake mainframes in terms of value shipped within the next two to three years when worldwide installations will approach 20 million systems.

- Users are becoming more sophisticated, educating themselves in an effort to obtain the optimum end results through proper equipment and services.

  • Potential solutions to information handling have been discovered through network management and data communications.

  • Availability of protocol simulators and converters to link incompatible equipment has broadened users' choices.

- The need for vertical market products (hardware and software) and corresponding planning, sales, marketing and support skills required to sustain growth rates are driving vendors to expand their products and services.

- Competition in all information handling market sectors is growing keener.

• Field service has responded to these rapid and major changes in the market place with resiliency and flexibility.

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- Service is finally being recognised as a business.

- Field service sponsored activities (e.g., maintenance, training, software, systems support) continue to expand in terms of new revenue opportunities.

- Productivity measures are being implemented with significant gains towards or enhancements of field service profitability.

2. FIELD SERVICE REVENUE GROWTH, 1982-1987

- Field service revenue is expected to grow at a diminishing rate, beginning at a projected rate of 15% from 1982 to 1983 and falling to a projected rate of 13% between 1986 and 1987.

  - Exhibit II-1 indicates that Western European field service revenue will be $9.3 billion by 1987.

  - The average annual growth rate (AAGR) for the five-year period will be 14.4%.

- Diminishing growth rates for field service revenues result from both market and technical factors.

  - Competitive forces have given rise to greater elasticity in maintenance pricing.

  - Whereas previously users perceived no alternatives to the manufacturer's (or his agent's) service, this monopolistic characteristic has eased.

    . Third-party maintenance is growing as an acceptable alternative.

    . Self-maintenance can also be achieved with more confidence.

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EXHIBIT II-1

WESTERN EUROPEAN FIELD SERVICE MAINTENANCE REVENUE
AND EMPLOYMENT FORECAST, 1982-1987

YEAR	FIELD SERVICE REVENUES ($ millions)	NUMBER OF FIELD ENGINEERS (thousands)	MAINTENANCE REVENUE PER FIELD ENGINEER ($ thousands)
1982	$4,756	58	$82
1983	5,488	61	90
1984	6,311	64	99
1985	7,220	67	108
1986	8,216	69	119
1987	9,301	72	129
AAGR	14.4%	4.6%	9.5%

AAGR = Average Annual Growth Rate

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- Users are reducing the amount of shifts covered under mainte-
  nance.

- In at least two known and recent cases, users have rejected maintenance contracts with manufacturers and, instead, have bought insurance policies for their equipment from companies such as Lloyds of London.

- IBM has significantly reduced maintenance prices for System 370 hardware in response to greater competition.

- Degradation of maintenance revenues will also occur from technically derived stimuli.

  - Smaller, microprocessor-based systems will flourish and these do not have heavy maintenance prices.

  - While, quantitatively, average sizes of equipment will be reduced, qualitatively, the systems will improve.

- Field service revenue per field engineer has increased, and will continue to, because of new maintenance and management techniques yielding greater productivity.

- The number of field engineers is expected to grow but at a slower rate than revenue.

- As the installed base migrates to newer products and lower maintenance charges, revenue deterioration will become a major challenge for field service managers.

3. FIELD SERVICE EXPENSES

- Field service has generally been the last or one of the last organisations in a vendor's firm to receive serious cost-cutting targets.

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- Management has been careful to avoid constraints and restrictions regarding service.

- However, in a poor economic environment and with competitive and technical pressures evoking service revenue concerns, field service will no longer escape the budget cutting exercises that other departments suffer.

- Service managers must learn to make the necessary cost reductions without compromising the quality of service and, ultimately, customer satisfaction.

- Exhibit II-2 reflects the changing nature of field service costs as analysed on a per call basis.

  - The absolute cost of a typical call is expected to increase 16% in 1983 over 1982, and this is largely due to wage increases required to retain good technical personnel.

  - Direct labour and travel labour allocations of cost rise modestly, reflecting necessary new technicians to cover equipment in the field and support locations.

  - Spare parts and materials allocations do not change.

  - Travel expense will drop significantly, by 11%, reflecting less travel overall. More trouble-shooting will be done remotely, from a central support location.

  - Overhead and burden become excellent targets for cost cutting and this is reflected with a 6% decline.

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EXHIBIT II-2

TREND ANALYSIS OF FIELD SERVICE COSTS PER CALL

COMPONENT	1983 PERCENT CHANGEOVER 1982
Average Cost	+16 %
Direct Labour	+ 3
Travel Labour	+ 6
Parts and Materials	0
Travel Expense	-11
Burden/Overhead	- 6
Number of Calls Per Engineer Per Week	+ 6

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4. MAINTENANCE PRICING

● Because of competitive pressures, contract maintenance price increases will be restricted to 6.4% overall.

- Exhibit II-3 provides a pricing analysis for 1982 and 1983 in terms of what the users and vendors separately perceive.

- While a 7% price increase is expected by users, they are prepared to live with a 9.7% increase if pressed.

● Hourly per call rates will be increased by 9.5% from an average rate of $63 in 1982 to $69 in 1983.

- Exhibit II-4 shows hourly rate analyses by country/currency.

- Expected changes in rates range from $31 to $112 per hour in 1982 to $32 to $116 in 1983.

5. GROWTH OF SOFTWARE MAINTENANCE

● Systems software maintenance, now commonly (though not solely) the responsibility of the field service organisation, has yet to be fully exploited as a revenue base:

- Only partial site development has been achieved for all the systems software options available on the hardware.

- Many systems software items have service charges that are inappropriate to the ongoing development and error correction needed at the item's particular stage of development.

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EXHIBIT II-3

PRICING PERCEIVED BY USER AND VENDOR
(percent)

PRICING	VENDOR THINKS	USER THINKS
The percent increase in maintenance prices over the past 12 months:		
● All (Average)	5.7%	7.6%
● By Country		
– U.K.	–	8.6
– W. Germany	–	6.3
– France	–	9.8
– Benelux	–	5.6
Forecasts of increase for next year:		
● All	6.4	7.0
● By Country		
– U.K	–	8.2
– W. Germany	–	4.5
– France	–	9.6
– Benelux	–	5.7
Threshold of pain for next year:		
● All	11.0	9.7
● By Country		
– U.K.	–	9.6
– W. Germany	–	8.1
– France	–	12.5
– Benelux	–	8.7

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EXHIBIT II-4

AVERAGE CHARGE-OUT
HOURLY RATE

CURRENCY	1982		1983	
	AVERAGE	RANGE	AVERAGE	RANGE
Pound	£ 38	19–68	42	20–70
Dollar	$ 63	31–112	69	32–116
Mark	163 DM	81–291	180	86–300
Franc	459 Fr	229–822	508	242–846
Guilder	177 Fls	89–317	196	93–326
Swiss Franc	140 SwF	70–250	155	74–258
Krone	475	237–849	526	250–874

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- Once the configuration sale has been made, salesmen do not target systems software sales, unless the user requests them or a particular hardware upgrade demands them.

- IBM alone has been successful in marketing systems software. Indeed, the complexity of options has resulted in overkill of user requirements in some cases (e.g., 4300 series where systems software library options need careful user screening if they are to be deleted from the chargeable items list).

- As vendors become more adept at focussing on this opportunity, systems software sales (and the maintenance revenue that goes with them) will rapidly increase over the 1983-1984 period.

6.   PERSONNEL POLICIES

- Changes in the product mix, the move towards parts exchange/board swapout, and the establishment of software support centres and remote diagnostic centres are changing the nature and level of expertise field service organisations require. The need now is for:

    - Small numbers of highly specialised, highly experienced professionals to man support centres.

    - Many nonspecialised, low-level skilled engineers for site visits.

    - Small numbers of highly skilled engineers for on-site customer residency, where required.

    - Small numbers of highly experienced spares centres, diagnostic centres, and software support centre managers.

    - Small cadre of financial administrators and planners.

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- Many of the administrative and managerial skills needed for these new structures will not be found in the current field service force. Promoting good engineers into managerial positions is usually a double disaster, turning a good engineer into a mediocre manager.

- Clear personnel policies that enable the current field service force to understand the changes that are carried out are vital to successful creation of the new structure. Otherwise dissatisfaction, defection, and widespread loss of morale can result in a confused field service staff.

B.   RECOMMENDATIONS

1.   LONG-RANGE PLAN

- Today's field service manager must develop long-range strategy plans with important considerations in mind:

    - Shorter average product life.

    - Accelerating change of product mix.

    - Increased responsibility of field service to overall company profitability.

    - Increased shortage of skilled manpower.

- IBM's new wave of aggression in all of its markets and its willingness to respond to competitive challenge with new technology products has accelerated product introduction from all vendors. This has resulted in a bewildering array of new, quasi-new, and patched-up (old) products on the market at a time of reduced sales and increased competition.

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- From the field service manager's standpoint this means more small-volume specialised products with short sales lives which are added to the installed base. This is the exact contrary of the ideal service environment of a small number of very high-volume, standard products.

- This accelerating change in the product mix has its impact on the personnel skill mix, which must be planned for. Like it or not, the field service manager will also face company demands for still higher revenue and profit levels, and he should plan for these. Hardware maintenance prices can be increased without excessive user reaction if each increase is accompanied by perceived service improvements. These must be identified and planned for.

- Software maintenance revenue can also contribute heavily. Today's system software maintenance is vastly underpriced.

- Productivity plans must be constantly reviewed in the light of the need for improved profit levels.

2. FIELD QUALITY ASSURANCE (FQA)

- Quality commands a premium. It also improves morale of the user base and the company work force. Quality audits should be standard procedure for all field service organisations.

- While it is normal for field service managers to expect that personnel are concerned with quality, it is important to demonstrate management's pre-occupation with this issue. Field staff must have the assistance and tools they need to improve their performance.

- FQA also demonstrates that vendor management believes users have a right to expect equipment to perform to specification, and to insure that all field change orders (FCOs) are implemented.

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- It also provides field management with the opportunity to review contracts, equipment and parts inventories, branch manpower loading, reporting procedures, and communications with support centre and headquarters staff.

- Finally, the summary of FQA data guides management towards real problem-solving (as opposed to inventing new procedures that simply add to the backlog of nonfunctioning controls).

3. THIRD-PARTY MAINTENANCE (TPM)

- The concept of field service has been expanded from an overhead cost to a profit centre. Well and good, but field service can go far beyond that.

- Where an existing field service network has service skills that match products commonly found in a vendor's user base (or even another user base that is complementary in terms of market, sector, or long-term company goal), there is an opportunity to offer TPM service to that product base.

- This may be accomplished in contractual agreement with the manufacturer of the product or in competition with him. In all cases it should fulfill a <u>total service and support</u> role to the user base, compatible with the vendor company's business goals.

- Field service is accepted as a product. It should therefore be sold as such, aggressively and to the widest market possible.

- Arguments against such an approach that are based on 'impacting the quality of service to our own users' must be expected - and refuted.

- Taking on an existing customer base of new products whose detailed composition and location are known in advance is far more profitable (and easier) than supporting a new sales campaign, which will produce installations at unknown intervals at unknown locations in unknown configurations.

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4.   SOFTWARE MAINTENANCE

● Systems software maintenance is a growing component of total service revenue, and will grow all the faster when prices are more compatible with the service rendered.

● Another aspect of software maintenance to examine is that of applications software, where the application is frozen in specification and requires substantial integration with systems software.

● In areas where this is possible, integrated maintenance support can cover hardware, systems software, and applications software.

● Some vendors are beginning to offer applications packages in vertical markets such as manufacturing, banking, and transportation (airlines mainly). In these areas, implementing integrated maintenance support is only a question of revising three separate contracts into a single contract.

5.   CHANGE IN MAINTENANCE STRATEGIES

● Vendors can meet the new challenges of service in a variety of ways, including:

   - Attempts at educating the user to use central repair shops and 'return for repair' contracts.

   - Adding additional tiers of response levels/types of contracts.

   - Test marketing third-party module repair/delivery service.

   - Partial user self-maintenance.

   - Redundant hardware left on-site (e.g., extra terminal).

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- User-purchased spares.

- Software support centres.

- Remote diagnostic centres.

- Facilities management service (of <u>all</u> equipment on-site from multiple vendors).

- Many vendors' cost control procedures still do not allow accurate monitoring of the impact of low-cost products on overall costs, and they are therefore not sure how big the problem is.

- Most vendors realise the need for accuracy, however. They have established or delegated profit centre responsibility within the field service organisation, and decentralised cost- and revenue-tracking.

- Organising for these changes in maintenance strategies is not easy, because it strikes at the heart of the traditional field service engineer skills profile.

III USER AND VENDOR ANALYSIS OF IMPORTANT
SERVICE CONSIDERATIONS

III USER AND VENDOR ANALYSIS OF IMPORTANT SERVICE CONSIDERATIONS

A. GENERAL

- This chapter of the 1982 Field Service Annual Report for Europe concentrates on certain fundamental service issues.

- These important issues and considerations are analysed from two points of reference.

    - As stated earlier, the overall research for this report is based on both user and vendor data.

    - While surveys for user and vendor were different, several common points were incorporated into both survey instruments. These included basic parameters of maintenance service:

        - System availability.

        - Response time.

        - Repair time.

        - Maintenance pricing.

        - Procedures.

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- User ratings of important maintenance issues are compared to principal activities of field service managers.

- These issues are studied and compared, user versus vendor, to reveal priority compatibilities and anomalies.

● In addition to the analysis of these important service considerations, this chapter also provides a comprehensive user evaluation of 50 maintenance service vendors.

- One analysis ranks vendors by type of equipment.

- Another scores vendors' service by country.

B. USERS' RANKING OF SERVICE VENDORS

I. EVALUATION BY TYPE OF EQUIPMENT/SERVICE

● Large systems, other mainframes, and peripherals are serviced well, according to users, as shown in Exhibit III-1.

- IBM, often considered the standard for service towards which other service groups strive, scored well above average.

. Their highest score was 8.1 in large systems.

. Their lowest rating was 7.6 in the peripherals, terminals and word processor equipment categories.

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EXHIBIT III-1

USERS' RANKING OF SERVICE VENDORS BY TYPE OF EQUIPMENT

VENDOR	LARGE SYSTEMS	OTHER MAINFRAME	PERIPHERALS, TERMINALS, WORD PROCESSORS	SYSTEMS SOFTWARE	AVER-AGE
AES	–	8	–	–	8.0
Amdahl	10	–	–	–	10.0
BASF	8	–	9	–	8.5
Burroughs	7.5	6.4	6.5	7.3	7.0
CDC	–	8.0	–	–	8.0
CFM	8	–	8	–	8.0
CIT (AES)	–	–	7.5	–	7.5
Cii Honeywell Bull	7.5	5.5	5.8	8	6.7
Computer Maintenance (DEC)	–	9	8.7	–	8.3
CPT	–	–	8.5	–	8.5
Datasaab	–	9	7	–	8.0
Data General	–	8	–	–	8.0
DEC	–	7.1	6.7	6.5	6.8
Electrobus (PET)	–	8	–	–	8.0
Ericsson	–	–	7.7	–	7.7
Ferranti	–	8	–	–	8.0
Gallis (CDC)	–	8	8	–	8.0
Geir (Datapoint)	–	–	4	–	4.0
General Automation	–	6	–	–	6.0
Harris	–	5	–	–	5.0
Hewlett-Packard	–	5.5	–	–	5.5

Rating: 0 = Poor, 5 = Average, 10 = Excellent

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EXHIBIT III-1 (Cont.)

USERS' RANKING OF SERVICE VENDORS BY TYPE OF EQUIPMENT

VENDOR	LARGE SYSTEMS	OTHER MAINFRAME	PERIPHERALS, TERMINALS, WORD PROCESSORS	SYSTEMS SOFTWARE	AVER-AGE
Honeywell	6.5	5.8	6.4	6.7	6.4
IBM	8.1	7.7	7.6	5.9	7.3
ICL	7	6.2	5.9	7.8	6.7
ITT	–	–	7	–	7.0
Krupp (IBM)	8	–	8	–	8.0
MDS	–	–	8	–	8.0
Memorex	–	–	8.1	–	8.1
Metric	–	10	10	–	10.0
MVS	–	–	–	7	7.0
NAS	8	7	7	–	7.3
NCR	6	7.7	6.3	6	6.5
Nixdorf	–	7	8	3	6.0
Olivetti	–	9	–	–	9.0
Paragon	4	–	–	–	4.0
Prime	–	7.3	7	5	6.4
Racal	–	8	–	–	8.0
Raytheon	–	–	8	–	8.0
Rediffusion	–	7.5	–	–	7.5
Scan Data	–	7	–	–	7.0
Siemens	–	9.1	8.3	2.8	6.7
Sperry Univac	–	8	7.2	6	7.1

Rating: 0 = Poor, 5 = Average, 10 = Excellent

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EXHIBIT III-1 (Cont.)

USERS' RANKING OF SERVICE VENDORS BY TYPE OF EQUIPMENT

VENDOR	LARGE SYSTEMS	OTHER MAINFRAME	PERIPHERALS, TERMINALS, WORD PROCESSORS	SYSTEMS SOFTWARE	AVER-AGE
SMS (IBM)	–	7	5	–	6.0
STC	–	–	7.5	–	7.5
Systime	–	7	–	–	7.0
TEK	–	7	8	–	7.5
TI	–	–	5	–	5.0
TPM (IBM)	–	8	–	–	8.0
Transac	–	8	8	–	8.0
Wang	–	–	7	–	7.0
Average	7.4	7.5	7.2	6.0	7.0

Rating: 0 = Poor, 5 = Average, 10 = Excellent

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- Amdahl, BASF, Siemens, Olivetti, CPT, Prime, Sperry Univac, CDC, Nixdorf, Data General, Ferranti, Racal, NAS were also rated successfully for hardware maintenance by users.

- Companies who were rated highly in one category of hardware but lower in others included Burroughs, Cii Honeywell Bull, Datasaab, Honeywell, ICL, NCR, and DEC.

- Third-party maintenance companies and distributers generally received acceptable ratings.

  - Gallis, CFM, Krupp, and TPM received good ratings.

  - Paragon and Geir received the lowest ratings (4).

- Systems software maintenance and support, while generally at acceptable levels, according to users, is significantly below hardware ratings.

  - Even IBM has a problem with software service, relative to their very good hardware service rating.

  - Siemens, too, was rated highly for hardware but just "fair" for software.

  - Nixdorf, like Siemens, is rated well for hardware service but not for software.

  - Cii Honeywell Bull and ICL provide good software service.

2.   EVALUATION BY COUNTRY

- All countries receive good field service, based on results summarised in Exhibit III-2.

  - There is very little differentiation, according to users.

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EXHIBIT III-2

USERS' RANKING OF SERVICE VENDORS BY COUNTRY

VENDOR	UNITED KINGDOM	FRANCE	GERMANY	BENELUX	SCANDINAVIA	ITALY	AVER-AGE
AFS	8	–	–	–	–	–	8.0
Amdahl	10	–	–	–	–	–	10.0
BASF	10	–	8	9	–	–	9.0
Burroughs	6.8	–	–	–	8	–	7.4
CDC	–	–	–	–	8	–	8.0
CFM	8	–	–	–	–	–	8.8
CIT (AES)	7.5	–	–	–	–	–	7.5
Cii Honeywell Bull	–	6.4	6	7.4	6.5	–	6.6
Computer Maintenance (DEC)	8	–	–	–	–	–	8.5
CPT	–	–	–	–	8.5	–	8.0
Datasaab	9	–	–	–	5	–	7.0
Data General	–	–	6	–	10	–	8.0
DEC	7.5	8	–	6.5	–	5.5	6.9
Electrobus (PET)	–	–	–	–	8	–	8.0
Ericsson	–	7	–	7	–	–	7.0
Ferranti	–	–	–	8	–	–	8.0
Gallis (CDC)	–	–	–	–	8.0	–	8.0
Geir (Datapoint)	–	–	4	–	–	–	4.0
General Automation	–	–	–	–	–	6	6.0
Harris	5	–	–	–	–	–	5.0

Rating: 0 = Poor, 5 = Average, 10 = Excellent

Continued

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EXHIBIT III-2 (Cont.)

USERS' RANKING OF SERVICE VENDORS BY COUNTRY

VENDOR	UNITED KINGDOM	FRANCE	GERMANY	BENELUX	SCANDINAVIA	ITALY	AVER-AGE
Hewlett-Packard	6	–	–	5	–	–	5.5
Honeywell	6.4	–	–	–	–	6.8	6.6
IBM	7.4	7	7.8	7.2	7.9	5.7	7.2
ICL	6.1	6.8	4	8.2	–	–	7.0
ITT	8	4	–	9	7	–	6.8
Krupp (IBM)	–	–	8	–	–	–	8.0
MDS	8	–	8	–	–	–	8.0
Memorex	6.8	9.5	8	8	–	–	8.1
Metric	–	–	–	–	10	–	10.0
MVS	–	–	–	7	–	–	7.0
NAS	–	7.3	7	8	–	–	7.4
NCR	6	–	7.3	–	7	–	6.8
Nixdorf	–	–	8	5	6	–	6.3
Olivetti	–	–	–	–	8	8	8.0
Paragon	–	–	–	–	4	–	4.0
Prime	8	7	–	–	6.3	–	7.1
Racal	8	–	–	–	–	–	8.0
Raytheon	–	–	–	8	–	–	8.0
Rediffusion	7.5	–	–	–	–	–	7.5
Scan Data	7	–	–	–	–	–	7.0
Siemens	–	–	6.4	7.5	–	–	7.0

Rating: 0 = Poor, 5 = Average, 10 = Excellent

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EXHIBIT III-2 (Cont.)

USERS' RANKING OF SERVICE VENDORS BY COUNTRY

VENDOR	UNITED KINGDOM	FRANCE	GERMANY	BENELUX	SCANDINAVIA	ITALY	AVER-AGE
Sperry Univac	6.1	8	9	–	7.7	–	7.7
SMS (IBM)	–	6	–	–	–	–	6.0
STC	–	9	–	6	–	–	7.5
Systime	–	–	–	7	–	–	7.0
TEK	–	8	–	–	–	7	7.5
TI	–	–	–	–	5	–	5.0
TPM (IBM)	–	8	–	–	–	–	8.0
Transac	–	–	–	8	–	–	8.0
Wang	6	–	–	–	–	–	6.0
Average	7.4	7.3	7.0	7.3	7.2	6.7	7.2

Rating: 0 = Poor, 5 = Average, 10 = Excellent

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FAE2

- The variation of all country average scores is small.

    . United Kingdom: 7.4.

    . France and Benelux: 7.3.

    . Scandinavia: 7.2.

    . Germany: 7.0.

- Italy is new to INPUT's 1982 analysis, and the relatively low score of 6.7 for users' satisfaction with service is still above average.

- Germany, among the group of veteran countries studied for service quality, is relatively low, but reflects the very high ideals of its expectations for maintenance.

- Among the winners, by country, are:

    - Amdahl and BASF in the U.K.

    - DEC, TEK, TPM, Sperry Univac, STC in France.

    - BASF, Cii Honeywell Bull, Siemens, Transac, and ICL do a good service job in the Benelux countries.

    - Burroughs, CDC, CPT, Data General, Gallis, IBM, Metric, and Sperry Univac are quite favourably received in Scandinavia.

    - Olivetti triumphs in the Italian market.

- Companies that should seek to improve service are as follows:

    - Cii Honeywell Bull in France and Germany.

INP

- Data General in Germany.

- Digital Equipment in Italy.

- Geir (Datapoint) in Germany.

- General Automation and IBM in Italy.

- Honeywell in the U.K.

- ITT in France.

- NCR, Sperry Univac, and Wang in the U.K.

- Nixdorf in Benelux and Scandinavia.

- Paragon, Prime, and TI in Scandinavia.

- Home-based service companies are subject to more criticism, except for Italy.

C.   SYSTEM AVAILABILITY

- Exhibit III-3 shows that in all cases vendors think they are currently providing better systems availability than users think they are.

    - The difference of opinion is not enough to alarm vendors of large systems.

    - The gap between what users and vendors believe for the remaining types of equipment is a revelation that vendors should definitely be cognizant of.

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EXHIBIT III-3

USERS' AND VENDORS' PERCEPTIONS OF
CURRENT SYSTEM AVAILABILITY
(percent uptime)

TYPE OF EQUIPMENT	VENDOR THINKS HE PROVIDES:	USER THINKS VENDOR PROVIDES:
Large Systems	97.7%	96.7%
Medium Systems	97.4	93.5
Small Systems	98.5	91.6
Minicomputers	98.4	91.2
Peripherals	98.1	92.7
Terminals	99.0	92.9
Word Processors	98.0	93.7

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- Vendors overestimate the minimum acceptable uptime that users will accept, as shown in Exhibit III-4.

    - Service managers think that minimum system availability for every type of equipment should be higher than do their user counterparts.

    - All availability figures exceed 90% and users usually have alternative means by which to compensate for at least 7% to 8% downtime. This takes the form of:

        - Equipment back-up.

        - Extra spare parts.

        - On-site field engineers.

D.   RESPONSE TIME

- Users see better overall response times currently from vendors than vendors think they offer. Exhibit III-5 summarises this.

    - Users believe they are getting better response for:

        - Medium systems.

        - Peripherals.

        - Terminals.

    - Users perceive worse response times than vendors think they provide for:

INPUT

EXHIBIT III-4

USERS' THRESHOLD OF UNACCEPTABLE UPTIME
AS PERCEIVED BY USER AND VENDOR
(percent uptime)

TYPE OF EQUIPMENT	VENDOR THINKS USERS WILL ACCEPT A MINIMUM OF:	USERS SAY THEIR BOTTOM LIMIT IS:
Large Systems	97.0%	94.6%
Medium Systems	94.9	93.2
Small Systems	97.5	93.5
Minicomputers	95.0	93.7
Peripherals	95.0	92.9
Terminals	97.5	88.9
Word Processors	98.0	95.6

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EXHIBIT III-5

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RESPONSE TIMES CURRENTLY PROVIDED BY VENDORS AS PERCEIVED BY VENDORS AND USERS
(in hours after notification)

TYPE OF EQUIPMENT	VENDORS THINK THEY PROVIDE:	USERS THINK VENDORS PROVIDE:
Large Systems	2.0	2.0
Medium Systems	2.5	1.9
Small Systems	2.0	2.3
Minicomputers	2.8	4.0
Peripherals	12.9	2.0
Terminals	3.5	2.7
Word Processors	3.0	4.0
Average	4.1	2.7

INPUT
FAE2 P68

.   Small systems.

.   Minicomputers.

.   Word processors.

- Users and vendors agree that a two-hour response time for large systems is what is currently provided.

- While users did not comment on microcomputers, vendors believe they currently offer a 4.5 hour response time.

● Minimum expectations of response times are perceived differently between user and vendor, as shown in Exhibit III-6.

● The overall average is misleading because of the 15-hour expected response time for peripherals as perceived by vendors.

E.   REPAIR TIME

● Exhibit III-7 indicates diverse opinions about length of time to repair systems, as perceived by users and vendors.

● With the exceptions of word processors and peripherals, users believe that repairs are accomplished in less time than vendors think they are.

● The most significant disparity is in large systems where the perceived repair times are 0.8 hour and 2.9 hours for users and vendors respectively.

- The 1.1 hour differential may be accounted for by 'behind the scenes' repair activity by the vendor which the user doesn't see.

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EXHIBIT III-6

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RESPONSE TIME MINIMUM EXPECTATIONS
(in hours after notification)

TYPE OF EQUIPMENT	USER THINKS MINIMUM IS:	VENDOR THINKS THAT USERS' MINIMUM IS:
Large Systems	1.6	1.5
Medium Systems	2.0	2.0
Small Systems	3.0	2.0
Minicomputers	4.6	1.5
Peripherals	2.0	15.0
Terminals	3.3	3.5
Word Processors	4.0	4.0
Average	2.9	4.2

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INPUT
FAE2 P67

EXHIBIT III-7

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MEAN TIME TO REPAIR
AS PERCEIVED BY USER AND VENDOR
(in hours)

TYPE OF EQUIPMENT	USERS BELIEVE IT TAKES:	VENDORS BELIEVE IT TAKES:
Large Systems	0.8	2.9
Medium Systems	1.3	2.3
Small Systems	1.7	2.5
Minicomputers	3.0	3.8
Peripherals	2.3	1.5
Terminals	2.3	3.0
Word Processors	4.3	3.5
Average	2.2	2.8

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- One example of this is technical assistance provided to the site engineer from a product support centre.

F.   PRICING

- When it comes to pricing of maintenance, the disparities between user and vendor are minimal.

- The user is accustomed to vendors' price increases and has caught on to the pattern of regular price increases.

- Users think they received an overall price increase of 7.6% last year while vendors think they increased prices by 5.7%, as shown in Exhibit III-8.

  - Users think they will receive a 7% increase in maintenance prices while vendors plan to increase prices by 6.4%.

  - Users previously conditioned to a monopolistic maintenance market, are now (because of more competition) prepared to pay only 9.7% while vendors continue to think maintenance prices are inelastic. Vendors think users will withstand an 11% increase.

G.   SERVICE FUNCTION PRIORITIES FROM USER AND VENDOR PERSPECTIVES

- Exhibit III-9 shows a very close correlation between vendor and user priorities regarding important maintenance issues.

  - The correlation is close between:

    • Vendor and user.

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EXHIBIT III-8

PRICING PERCEIVED BY USER AND VENDOR
(percent)

PRICING	VENDOR THINKS	USER THINKS
The percent increase in maintenance prices over the past 12 months:		
• All (Average)	5.7%	7.6%
• By Country		
- U.K.	-	8.6
- W. Germany	-	6.3
- France	-	9.8
- Benelux	-	5.6
Forecasts of increase for next year:		
• All	6.4	7.0
• By Country		
- U.K.	-	8.2
- W. Germany	-	4.5
- France	-	9.6
- Benelux	-	5.7
Threshold of pain for next year:		
• All	11.0	9.7
• By Country		
- U.K.	-	9.6
- W. Germany	-	8.1
- France	-	12.5
- Benelux	-	8.7

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EXHIBIT III-9

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VENDOR AND USER PRIORITIES

ACTIVITY/ISSUE	1981		1982	
	VENDOR PRIORITY	USER PRIORITY	VENDOR PRIORITY	USER PRIORITY
Equipment Reliability	1	1*	1	2
Response Time	2	3	2	3
System Availability	4	1*	3	1
Repair Time	3	4	4	4
Price of Maintenance	5	5	5	5
Work Force Stability and Retention	6	6	6	7
Escalation Procedures	7	7	7	6

Rating: 1 = Important, 10 = Not Important

*Tie

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. By year to year; i.e., 1981 versus 1982.

- Equipment reliability is the highest priority, overall, by users and vendors alike.

- System availability is the highest priority for users. Vendors do not view it as high but are rapidly learning its importance.

- Response time ranks next in importance for users and vendors.

● Low priority items, as viewed by vendor and user alike, are such mundane activities as escalation procedures and work force stability and retention.

IV VENDOR ANALYSIS

IV VENDOR ANALYSIS

A. ANALYSIS OF VENDOR FINANCIAL PERFORMANCE

1. REVENUE, BUDGETS, AND PROFITS, 1982-1983

- 1982 was a successful year for Western European field service managers, despite slowing equipment sales caused by international economic stress.

    - Creativity and ingenuity by field service helped foster timely new service methods.

    - The continued implementation of these new service techniques and products provided valuable contributions to cost reduction and revenue enhancement.

    - The established revenue base, especially middle-aged equipment which is cheaper to maintain, also contributed to field service profits.

- The average field service manager now handles a budget in excess of $8.5 million and expects to increase this by 10% in 1983. Revenue increases are expected to exceed cost increases by a factor of two so that gross margins will improve significantly.

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- Averages such as those shown in Exhibit IV-1 are useful for overall evaluations of vendor performance, but the individual company performances vary considerably.

- Field service, as an industry, is still accommodating a steady flow of new (small) suppliers but the greater part of the revenue and profit growth comes from the large established vendors.

- Gross margins averaged 18.5% of revenue in 1982 and are expected to improve more than six percentage points in 1983 to 25.3%.

- Profit before tax, nearly 13% in 1982, is also expected to improve significantly in 1983.

- Revenue and profitability comparisons are highlighted in Exhibit IV-2.

    - European field service managers expect revenue to increase by 20.5% in 1983.

    - INPUT forecasts the revenue increase more conservatively, at 15.4%, owing to the presence of more price competition and more reliable products, as well as user controlled maintenance options.

    - Budgets are expected to increase by 10.4% which basically provides for little organizational expansion.

        - The increase in budgets is largely for salary increases.

    - Gross margins and profit before tax are expected to increase by 6.8% and 3.7% respectively, according to field service managers.

        - INPUT believes these changes will be extremely challenging, especially in view of difficulty in meeting revenue plans.

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EXHIBIT IV-1

SUMMARY OF RESPONDENT VENDOR FINANCIALS

	CURRENCY																
	POUND		DOLLAR		MARK		FRANC		GUILDER		SWISS FRANC		KRONE	
COMPONENT	1982	1983	1982	1983	1982	1983	1982	1983	1982	1983	1982	1983	1982	1983
TOTAL SAMPLE REVENUE (millions)	£57.2	£68.0	$94.3	$113.5	244.8 DM	294.9 DM	691.6 Fr	833.0 Fr	266.6 Fls.	321.0 Fls.	210.5 Swf	253.6 Swf	714.4 DKr	860.6 DKr
AVERAGE FIELD SERVICE REVENUE (thousands)	6,350	7,650	10,478	12,623	27,178	32,742	76,772	92,489	29,591	35,649	23,368	28,152	79,312	95,549
AVERAGE FIELD SERVICE BUDGET (thousands)	5,175	5,715	8,539	9,430	22,149	24,460	62,566	69,094	24,116	26,632	19,044	21,031	64,636	71,380
AVERAGE FIELD SERVICE GROSS MARGIN (percent)	18.5%	25.3%	18.5%	25.3%	18.5%	25.3%	18.5%	25.3%	18.5%	25.3%	18.5%	25.3%	18.5%	25.3%
AVERAGE FIELD SERVICE PROFIT BEFORE TAX (percent)	12.7%	16.4%	12.7%	16.4%	12.7%	16.4%	12.7%	16.4%	12.7%	16.4%	12.7%	16.4%	12.7%	16.4%

Note: Currency based on pound sterling rates 11/11/82

Dollar = 1.65   Guilder = 4.66
Mark = 4.28   Swiss Franc = 3.68
Franc = 12.09   Krone = 12.49

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EXHIBIT IV-2

PERCENT CHANGE
1983 VERSUS 1982

Average Field Service Revenue	+20.5
Average Field Service Budget	+10.4
Average Field Service Gross Margin	+ 6.8
Average Field Service Profit Before Tax	+ 3.7

SOURCE: Vendor Interviews

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- Average revenue generation per field engineer is shown in Exhibit IV-3.

  - Average field service revenue per field engineer is expected to increase 35% between 1982 and 1983, according to European field service managers.

  - This seems too ambitious in view of other estimates provided by European service managers.

    - If revenues increase 20.4%, as predicted by field service managers, and field service engineers grow at 3%, a 35% increase in revenue per field engineer is not possible.

    - INPUT believes a more realistic growth rate for revenue per field engineer is 13%.

2. FIELD SERVICE REVENUE SOURCES

- An analysis of the activities that contribute to field service revenue focuses upon the areas of opportunity open to field service managers, as shown in Exhibit IV-4.

  - Currently, the placement of hardware at a customer site, whether for initial installation, upgrade, or relocation, gathers more revenue for field service than systems software; this is because either field service organisations do not maintain systems software, or software maintenance is bundled into hardware, license, or other categories.

  - Only 13% of the field service organisations polled receive credits from the sales organisations for service concessions provided to the user by sales.

  - A slightly larger percentage (20%) allows field service to handle supplies sales. Customers find it more convenient to purchase supplies

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EXHIBIT IV-3

AVERAGE REVENUE PER FIELD ENGINEER
(thousands)

CURRENCY	1982	1983
Pound	£ 50.2	67.7
Dollar	$ 82.8	111.7
Mark	214.9DM	289.8
Franc	606.9Fr	818.5
Guilder	233.9Fls	315.5
Swiss Franc	184.7SwF	249.1
Krone	627.0Dkr	845.1

SOURCE: Vendor Interviews

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EXHIBIT IV-4

SOURCE OF FIELD SERVICE REVENUE, 1982

COMPONENT	PERCENT		
	Respondents	Average Contribution	Range
● Hardware and Spares	100%	46%	40-100%
● Installation, Relocation, and Upgrades	60	5	3-15
● Credits from Sales	13	2	4
● Training and Documentation	33	3	5
● Supplies	20	4	5-7
● Systems Software	13	23	40
● Applications Software	20	17	30

SOURCE: Vendor Interviews

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FAE2 P26

from field service personnel than from a salesman since service engineers are at the site more often than salesmen.

- Systems software maintenance has the potential to be the fastest growing single source of field service revenue over the next five years, as more and more vendors transfer this responsibility to field service. This requires organisational planning.

- Applications software is unlikely to follow the same course, remaining with either the user, third-party software house, or vendor support divisions outside field service.

3. TYPICAL FAULT CALL COSTS, 1982-1983

- The analysis of the average cost of a fault call is of value to field service managers since it pinpoints areas of potential savings and tells them how well they are performing in relation to their competitors.

- Maintenance charges are becoming an important part of the user's decision process at sales time and, in conjuction with equipment performance, are already significant to his ongoing satisfaction as a customer.

- The pressure on the field service manager to maintain or improve profitability levels translates into cost control, since revenue is not under his control.

- Exhibit IV-5 analyses the per call costs for all equipment categories, giving the average dollar cost of a fault call and the proportion of this cost that is spent on labour (direct and travel), parts and materials, travel expense, and overhead. Finally the average number of these calls per FE is shown for the vendor sample.

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EXHIBIT IV-5

COST BREAKDOWN OF
A TYPICAL FAULT CALL

COMPONENT	1982	1983	PERCENT CHANGE
Average Cost (dollars) *	$262	$305	+16%
Direct Labour (percent)	32%	33%	+ 3%
Travel Labour	18%	19%	+ 6
Parts and Materials	23%	23%	0
Travel Expense	9%	8%	-11
Burden/Overhead	18%	17%	- 6
Number of Calls per Engineer per Week	9.7	10.3	+ 6%

* Other currencies: (based on rate of exchange 11/11/82)

AVERAGE COST	1982	1983
Pound	£159	£185
Mark	681 DM	792 DM
Franc	1,922 Fr	2,237 Fr
Guilder	741 Fls.	862 Fls.
Swiss Franc	585 Swf	681 Swf
Krone	1,986 DKr	2,311 DKr

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FAE2 P32

4.   PROFIT AND LOSS (P/L) VERSUS COST CENTER

- In 1982, P/L center operation began for a large number of field service organisations, raising the overall proportion of vendors operating this way to 80%, as shown in Exhibit IV-6.

- This proportion has constantly risen since INPUT's first European field service study in 1980.

- Attention is now centred on how much P/L control is delegated down the line. This can be a partial delegation only.

- The significance of this delegation is fourfold:

    - It pinpoints problem operations.

    - It sensitizes local management to the P/L issue, and creates new goals for them to target.

    - It upgrades the image and status of local managers in their own eyes and broadens their skills.

    - It increases company-wide P/L control through finer analysis.

- A rising proportion of mature vendors have pushed the P/L delegation all the way to branch level. Summary P/L control is retained by the next superior level in all cases.

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EXHIBIT IV-6

PROFIT AND LOSS OR
COST CONTROL DELEGATION

Profit and Loss	80%
Cost Control	20

Profit/Loss Delegation	
Headquarters	58%
Regional	33
District	17
Branch	25
Note: Categories are multiple choice and are not mutually exclusive.	

Source: Vendor Interviews

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5. COSTS AND REVENUE TRACKING

- Tracking costs and revenue, long the cornerstone of field service controls, has been taken all the way down to site within customer for 20% of the vendors interviewed, as shown in Exhibit IV-7.

- The next superior level does not always exercise control; i.e., control at product level does not imply control at product line level (in fact, it very often implies no product line control).

- The installations controlled at the customer level are generally large or very large customers. Nevertheless, INPUT expects this practice to extend down the installed base over the next five years.

- A minority of vendors continue to withhold control at the field service regional or country level avoiding heavy administrative/reporting load at these points.

6. ACCOUNTING TREATMENT OF SPARE PARTS

- There is a broad range of methods for handling spare parts from an accounting standpoint, both within each category of vendor and from category to category.

- Only 13% of vendors inventory all parts; most expense them below certain values (e.g., $50, $100). The average values are shown in Exhibit IV-8.

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EXHIBIT IV-7

COSTS AND REVENUE TRACKING

LEVEL OF CONTROL	PERCENT ACTIVE
Product Line	13%
Product	27
Customer	13
Site	20
Region	7
Country	7

Source: Vendor Interviews

Note: Categories are multiple choice and are not mutually exclusive.

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EXHIBIT IV-8

ACCOUNTING TREATMENT OF SPARE PARTS, ALL SYSTEMS

Parts are expensed when they are less than the values shown.

CURRENCY	VALUE AVERAGE	VALUE RANGE
Pound	£ 82	5-170
Dollar	$ 135	8-280
Mark	351DM	21-728
Franc	991Fr	60-2,055
Guilder	382Fls	23-792
Swiss Franc	302SwF	18-626
Krone	1,024DKr	62-2,123

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B.   ORGANISATION AND STAFFING

I.   FIELD SERVICE REPORTING

- The growth of field service revenue in relation to overall company revenue and the proportion of margin contributed by field service continues to promote the reporting level of field service organisations.

- More and more field service operations now have the ear of corporate planning and top management. This is likely to have far-reaching effects on product quality and the marketing of field services in the near future.

2.   FIELD SERVICE PERSONNEL DISTRIBUTION

- The total sample of 15 vendors interviewed included a large proportion of small- and medium-sized field service organisations (average 1982 field service revenue $10 million).

- As a result, the average distribution by function is weighted towards smaller organisations where overhead functions are a higher percentage of total field service personnel.

- Exhibit IV-9 shows the average distribution of responsibilities of the 1982 sample.

    - The overall growth trends are significant: faster growth in the number of technical support engineers than in engineers.

    - This reflects the trend towards more central and sophisticated technical talent to support board swapping engineers.

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EXHIBIT IV-9

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FIELD SERVICE PERSONNEL DISTRIBUTION BY FUNCTION

	1982	1983	CHANGE (percent)
Average Number Field Service Employees	335	345	3.0%
– Average FS Engineers	236	242	3.0
– Average Technical Support Engineers	22	26	18.2
– Average FS Administrators	28	28	0
– Average FS Supervisors	29	29	0
– Average Field Line Managers	20	20	0

Total Sample: 15 Vendors

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- The sample also showed no change in the increase in the average percentage of total field service staff that at any one time is on a training course: in both 1982 and 1981 this was 17%.

- The number of customer sites with resident engineers is also not expected to increase, and sites serviced by remote diagnostics will grow by eight times according to respondents.

- Meanwhile the number of branch offices is expected to increase by 12.5% in 1983.

3.   TYPICAL FIELD SERVICE SALARIES

- The 1982 survey established salary ranges for two new categories of field engineering staff who operate out of support centres:

    -    Hardware technical support engineers.

    -    Software technical support engineers.

- Salary increases in 1982 were dropped to an average of 11.8% from 14% in 1981. Reduced inflation and employment in field service and other industries have meant stagnant salaries.

- In 1982, software specialists in technical support were the most favourably treated category as added emphasis on the integration of systems software maintenance with hardware maintenance gathered pace, as shown in Exhibit IV-10.

- Qualified and senior engineers also received good increases, while more mature supervisors and line managers' increases fell, reflecting the poor economy and "golden handcuff" syndrome. "Golden handcuffs" describe employees who are locked into company policies and benefits, including pay, because of their age; i.e., they are too old to change jobs even if dissatisfied.

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EXHIBIT IV-10

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AVERAGE SALARY RANGES BY FUNCTION

FUNCTION	AVERAGE YEARLY SALARY 1982 ($ thousands)	RANGE OF SALARY ($ thousands)	PERCENT INCREASE	
			1981	1982
Trainee Engineer	$12.5	$10.5-14.5	12.5%	9.9%
Qualified Engineer	13.5	12.5-17.1	14.1	12.5
Senior Engineer	16.6	11.6-13.2	14.3	12.4
Technical Support Hardware	21.6	18.3-23.4	14.1	11.9
Technical Support Software	18.8	14.4-20.5	15.0	13.5
Supervisor	20.9	17.5-23.1	14.7	12.0
Line Manager	24.0	22.3-29.5	13.6	10.9

Source: Vendor Interviews

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4. FIELD ENGINEERING PERFORMANCE INDICATORS/MEASUREMENT TECHNIQUES

- Real improvements have been implemented by field service management in responding to users' concerns: 48% of respondents' companies said that performance of first-line managers was based on customer satisfaction, as expressed in user surveys commonly carried out on a semiannual or quarterly basis, as shown in Exhibit IV-11.

- Financial criteria are also important, accounting for 35% of all criteria mentioned.

- While customer satisfaction is an important measure, employee satisfaction is also taking on an increased importance.

C. FIELD SERVICE PRICING

1. PRICING METHODOLOGY

- The pricing nethodology used by vendors is easily classified into three major areas:

    - Cost-based pricing (bottom up).

    - Sales value-based pricing (top down).

    - Market-based pricing (either IBM price umbrella, competition, or "what the market will bear").

- Exhibit IV-12 shows the relative importance of each of the above three areas.

- Exhibit IV-13 provides hourly rate ranges and averages for 1982 and 1983.

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EXHIBIT IV-11

FIRST-LINE MANAGERS' PERFORMANCE MEASUREMENT

RANK	CRITERION	INCLUDES	PERCENT OF ALL MENTIONS
1	Customer Satisfaction	System performance, customer satisfaction, repeat calls, MTTR/ MTBF,* response time	48%
2	Financial	Revenue, costs, P & L, direct versus indirect, receivables, overtime to base, asset to rev- enue ratio	35
3	No Measure		10
4	Employee Satisfaction	Attrition rate, employee satisfaction	7
			100%

*Mean Time to Respond/Mean Time Between Failures

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EXHIBIT IV-12

MAINTENANCE PRICING METHODOLOGY

RANK	CRITERION	PERCENT OF ALL MENTIONS
1	Percent of Hardware Sales Price*	32%
2 (tie)	Cost of Service	27
2 (tie)	Competition	27
4	Other (corporate guidelines, nature and value of support required)	14
	TOTAL	100%

* Maintenance as a percent of hardware sales price

    Range: 7.6% to 16.0%

    Median: 9.0%

    Mean: 10.6%

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EXHIBIT IV-13

AVERAGE CHARGE-OUT
HOURLY RATE

CURRENCY	1982		1983	
	AVERAGE	RANGE	AVERAGE	RANGE
Pound	£ 38	19-68	42	20-70
Dollar	$ 63	31-112	69	32-116
Mark	163DM	81-291	180	86-300
Franc	459Fr	229-822	508	242-846
Guilder	177Fls	89-317	196	93-326
Swiss Franc	140SwF	70-250	155	74-258
Krone	475DKr	237-849	526	250-874

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- Margin adjustment of costs varies from vendor to vendor: some add a gross margin between 25% and 40% to fully burdened costs; some multiply direct costs by 300%; others start from basic costs, work up to standard maintenance hours per device or system, and then multiply by hourly charge-out rates per engineer.

- Sales value percentages (varying from 7.6% to 16%) are often used at the initial stage of a product's launch when actual field repair costs are not known. Thereafter adjustments are made on a cost-plus basis.

- A significant proportion of vendors simplify the whole process to 'a percentage of sales value per month' and hope that revenue more than offsets costs.

- The percentage of sales price can be finely tuned by high-frequency breakdown items, vintage of products maintained, complexity of equipment, density of installed base, or service delivery method.

- Some service managers can control geographic dispersion of products based on service costs: 'if we can't break even at competitive maintenance rates, we won't sell the product.'

- Others have adopted a more subtle approach taking into account not only costs, competition, and percent of sales value, but also level of support (value customer receives), cost of delivering that level of service, and the impact of maintenance charges on the customer's cost of ownership.

2. MAINTENANCE PRICING BY EQUIPMENT CATEGORY

- Exhibit IV-14 depicts respondents' assessments of current maintenance pricing, by equipment category and expressed as a percentage of hardware purchase price.

    -   Large and medium systems' maintenance costs to the user, per year, are 5% of the hardware equipment price.

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EXHIBIT IV-14

MAINTENANCE PRICING

EQUIPMENT CATEGORY	AVERAGE PURCHASE PRICE ($ thousands)	AVERAGE MONTHLY MAINTENANCE CHARGE ($ hundreds)	AVERAGE ANNUAL MAINTENANCE AS PERCENT OF PURCHASE
Large Systems	$1,400.0	$6,000	5.0%
Medium Systems	800.0	3,300	5.0
Small Systems and Minicomputers	58.5	521	10.7
Microcomputers	2.0	20	12.0
Peripherals	6.0	45	9.0
Terminals	1.0	10	12.0
Word Processors	5.0	50	12.0
Data Communications	5.9	39	7.9

SOURCE: Vendor Interviews

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- Data communications, peripherals, small systems, and minicomputer maintenance costs to the user are 7.9%, 9%, and 10.7% respectively.

    . A spokesman for a very large international minicomputer manufacturer predicts minicomputer maintenance will become 3% of hardware equipment price within the next two years.

    . This is due to increasing pricing competition and new products which will have 'five times current reliability.'

- Microcomputers', word processors', and terminals' maintenance cost users 12% of the product cost.

● Contractual price change notification periods, price increases, and expectations are summarised in Exhibit IV-15.

    - Depending on equipment type, prices are expected to increase in 1983 by about 4% on average, ranging from 0 to 12%.

    - Users are thought by vendors to be willing to accept an average next price increase of about 8%.

3.   PRICE REDUCTIONS BY DELIVERY MODE

● One important aspect of maintenance costs to vendors is the mode of delivery of the service; e.g.:

    - Carry-in/mail-in (by user).

    - Device swapout (by user).

    - Pickup and delivery (by third party).

● Another aspect is special conditions that help reduce vendor costs; e.g.:

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EXHIBIT IV-15

PRICING, TERMS, AND EXPECTATIONS

EQUIPMENT CATEGORY	NOTIFICATION PERIOD TO INCREASE PRICES		PERCENT INCREASE IN LAST 12 MONTHS		FORECAST INCREASE FOR NEXT 12 MONTHS		PERCENT INCREASE THAT WOULD BE UNACCEPTABLE	
	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE
Large Systems	90 Days	30 Days - 12 Months	5%	0-7%	4%	-25% to +7%	0	0
Medium System	90 Days	90 Days	14	13-15	12	12	<13%	<13%
Small Systems	60 Days	30-90 Days	No Data	No Data	No Data	No Data	No Data	No Data
Minicomputers	70 Days	30-90 Days	7	5-13	4.5	4-5	6	5-10
Microcomputers	30 Days	30 Days	0	0	0	0	-	-
Peripherals	90 Days	30-120 Days	5	0-10	9	8-10	14	12-16
Terminals	60 Days	30-90 Days	0	0	5	0-10	16	16
Word Processors	30 Days	30 Days	0	0	0	0	-	-
Data Communications	90 Days	30-90 Days	3	0-15	4	0-15	18	15-20

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- Cluster maintenance (multiple systems at one site).

- User self-maintenance.

- Self-installation for terminals.

- Vendors were asked what level of reductions they apply to each of these, and the results are summarised in Exhibit IV-16.

- Carry-in/mail-in by users obviates the need for an on-site visit by the vendor. It also implies that the user accepts reduced response time due to transportation delays and does not expect immediate repair.

- Compensation offered to users for these vendor cost reductions is high, averaging 40% of normal service rates.

- Device swapout allies to self-diagnosing equipment (or remotely diagnosed equipment), where user staff replaces the failed part with an equivalent from a kit of spares left for this purpose by the vendor. A further refinement of this situation is for the customer to purchase the kit of spares.

- Cluster maintenance reductions recognise the benefit to the vendor of single visits for multiple systems. This is partially returned to the customer as a rebate.

- User self-maintenance covers a wide range of self-service, and the range of discounts is correspondingly wide. At one end of the scale it is another name for device swapout, and at the other end it is full responsibility for equipment service with the vendor as parts wholesaler.

- Self-installation of terminals ('plug in and play') deserves a 50% reduction off the service price.

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EXHIBIT IV-16

PRICE REDUCTIONS BY DELIVERY MODE

DELIVERY MODE	PERCENT OF VENDORS OFFERING	AVERAGE PERCENT REDUCTION OFFERED
Carry-In/Mail-In	20%	40%
Device Swapout	7	0
SPECIAL CONDITIONS		
User Self-Maintenance	10	13
Cluster Maintenance	7	20
Self-Installation (Terminals)	7	50

* While 7% of vendors surveyed offer device swapout, it is considered part of normal service and is not discountable.

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4. MARKETING OF FIELD SERVICE CONTRACTS

- Today's market shows a trend towards partial customisation of service contracts to each category of user. Single contract service is principally found in startup situations (new vendors) or in new markets (e.g., personal computers).

- The packaging of service, as a product, and the attendant analysis of competitive offerings are traditional marketing functions. For this reason many vendors, after deciding to market field services, place the responsibility in the hands of marketing/sales.

- This is not a good solution to the problem. Marketing/sales perceive field service as a necessary evil - the concept of marketing such a service does not come easily.

- Marketing/sales' understanding of field service is limited; how can they meaningfully package a product that they do not understand? The motivation for field service product marketing campaigns (and for sales to sell clean service contracts) is not yet established.

- On the other hand, it is not advisable to give field service the entire responsibility for marketing its products: the workings of marketing are as strange to field service as field service is to marketing.

- It appears that most vendors have come to the same conclusions:

    - Fifty percent of responding vendors make field service _and_ marketing jointly responsible for marketing field service products.

    - Twenty-eight percent place the responsibility solely in the hands of field service.

    - Twenty-two percent make marketing responsible.

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D.   EQUIPMENT DISTRIBUTION BY TYPE OF ENVIRONMENT

- A key aspect of designing reliability into any product is the definition of the quality of the environment in which the product is expected to perform. Environmental factors such as heat, humidity, and power source can change within the limits defined for the environment.

- Increased use of information processing equipment outside the controlled environment of the DP room presents equipment designers and maintainers with new challenges to sustain or improve reliability.

- A summary of equipment distribution by type of environment is shown in Exhibit IV-17.

E.   FIELD SERVICE MANAGEMENT PERFORMANCE

- In order to assess the performance of field service management over the 1981-1982 period, the principal problem areas that field service managers spent their time on in 1981-1982 were identified.

- Their own evaluation of their success in solving problems found in the 1981 survey was then obtained along with qualitative assessment of improvements in equipment system availability response/repair times and mean time between failures.

- Finally the field service manager's view of the most significant field service industry developments in 1981 was tabulated against anticipated developments in the year in progress.

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EXHIBIT IV-17

EQUIPMENT DISTRIBUTION BY TYPE OF ENVIRONMENT
(percent)

EQUIPMENT CATEGORY	DP ROOM	OFFICE	PLANT/FACTORY
Mainframes	88%	12%	0%
Small Business Systems	25	64	11
Minicomputers	29	51	20
Microcomputers	2	91	7
Word Processors	5	92	3
Executive Workstations	2	78	13
Peripherals	60	25	15
Terminals	1	79	20
Data Communications	45	40	15

Source: Vendor Interviews

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FAE2 P49

I.   PRINCIPAL ACTIVITIES FOR FIELD SERVICE MANAGERS, 1981-1982

- The rating of 15 key activity areas of field service managers was assessed on a scale of 1 = low, 10 = high.

- Fourteen of these activity options were fixed by the questionnaire, but a consistent mention in the 'other' category was promoting new maintenance business.

- The top vendor priority in 1982, as shown in Exhibit IV-18, has shifted from reliability, which is still a major concern, to efforts to gain new business.

- Reliability is a design issue directly affecting field service profitability and, in the users' eyes, company image and product competitiveness.

- This has always been the case, but in earlier years the pressures of market share expansion in a buoyant computer market no doubt relegated it to a position of lesser importance.

- In today's tight market, competitiveness, responsiveness, and profit have combined to bring reliability to the fore.

- Response time also continues to be an important issue. Whether this takes the form of on-site visit, remote diagnostic, or concerned telephone call, the important thing to the user is that he feels his problem is known to the vendor and is being processed.

- In both 1981 and 1982 the next problem in terms of time spent by field service management was system availability, a user-driven issue.

- The other issues selected by field service management have not changed significantly in 1982 from the positions held in 1981.

- They are a combination of vendor-sensitive and user-sensitive issues:

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EXHIBIT IV-18

PRINCIPAL ACTIVITIES OF FIELD SERVICE MANAGERS IN 1982
AND PLANS FOR 1983

ACTIVITY	CLASSIFICATION BY AMOUNT OF TIME SPENT IN YEAR	
	1982	1983
Promoting New Maintenance Business	4.67	8.00
Equipment Reliability	7.00	7.71
Response Time	6.85	7.40
System Availability	6.58	7.23
Repair Time	6.77	6.93
Price of Maintenance Services	5.92	6.79
Retaining Engineers	5.69	6.40
Escalation Procedures	4.23	6.00

Source: Vendor Interviews

Rating: 1 = Low, 10 = High

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FAE2 P34

- Repair time: user-driven.

- Retaining engineers: vendor-driven.

- Price of maintenance services: user- and vendor-driven.

- Escalation procedures: user-driven.

2. SUCCESS IN RESOLVING 1981 PROBLEMS

- In this analysis, field engineering managers were asked to rate themselves on their own efficiency in dealing with (and resolving) key 1981 issues.

- This has to be a somewhat subjective analysis. No single problem was rated at less than five (average success), which clearly suggests that field service managers have a high opinion of their success at handling problems.

- Exhibit IV-19 suggests the following in conjunction with Exhibit IV-18.

    - A lot of time was spent over the 1981-1982 period concentrating on new business opportunities. The keen interest in data communications suggests that network management and control is a potential new business opportunity for service vendors.

    - Customer satisfaction and meeting his demands was successfully addressed using response time, availability, and repair time criteria.

    - Likewise, living within budget limitations was a high priority, encompassing, indirectly, most of the principal activities concerning the field service manager.

    - The field service work force was stabilised, engineers were trained in new products and techniques, overall technical competence was im-

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EXHIBIT IV-19

FIELD SERVICE MANAGERS' EVALUATION OF
THEIR SUCCESS IN HANDLING PROBLEMS

RELATIVE SUCCESS	PROBLEM	AVERAGE ACTUAL RATING*	IMPLE-MENTED (percent)	PLANNED (percent)
1	Maintaining Data Communications Products	8.80	79%	0
2	Living within Budget Limitations	8.42	86	14%
3	Recruiting Field Service Engineers	7.58	86	7
4(tie)	Meeting Customer Demands	7.54	100	0
4(tie)	Providing Competitive Salary/ Compensation	7.54	93	0
6	Reducing Turnover of Staff	7.30	71	0
7	Training Field Service Engineers	7.15	93	7
8	Improving FE Technical Competence	6.23	93	0
9	Making Adequate Diagnostic Equipment Available	6.10	71	0
10	Reducing Spare Parts Shortages	5.92	100	0
11	Improving Product Quality	5.90	71	0
12	Providing Adequate Remote Diagnostics	5.57	57	14
13	Marketing Field Service	5.30	71	7
14	Maintenance Products through Distributors	5.25	21	0

*Rating: 1 = Low, 10 = High   SOURCE: Vendor Interviews

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FAE2 P35

proved, and staff were retained to a satisfactory degree by concentrating more on their needs.

- Some difficulties were experienced in improving product quality; this has now become a hot topic within corporate planning.

- Spare parts shortages continue to be of concern.

- A significant number of vendors (71%) now have a dedicated field service marketing staff, which enhances their objectives to seek new business opportunities.

- Only a small number (21%) of the vendors employ distributors for product maintenance, and those that do are not satisfied with the results.

- Having examined the current problems of field service managers and analysed their success in handling 1981 issues, the next section analyses their influence and involvement as managers in critical issues within their respective organisations.

3. INVOLVEMENT AND INFLUENCE OF FIELD SERVICE MANAGEMENT IN CRITICAL ISSUES, 1981-1982

- The influence wielded by field service managers can be evaluated by looking at the crucial issues that they were involved in during 1981 and 1982, and the importance they themselves attached to those issues.

- This evaluation covers several issues that coincide with problem areas and others that are more policy/decision-oriented. This section answers the question of where field service managers have influence.

- Exhibit IV-20 summarises field service managers' evaluations of their influence in various issues.

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EXHIBIT IV-20

INFLUENCE OF FIELD SERVICE MANAGEMENT ON
CRITICAL ISSUES, 1981-1982

ISSUE	1981 RATING*	1982 RATING
Selection of Test Equipment	4.15	5.23
Spare Requirements Levels	6.00	6.64
Pricing of Field Service	6.14	6.21
Contractual Terms/Acceptability	4.71	5.43
Sale of Field Services	4.43	5.00
Serviceability Design	1.64	2.36
Site Environment Acceptability	3.79	4.43
User Education	2.77	3.67
Equipment Specification	2.30	3.25
Nonbuilt-in Diagnostics	2.00	2.45
Built-in Diagnostics	2.09	2.73
Order Acceptance	3.64	4.43
Equipment Design	1.18	1.73
Geographical Marketing	2.83	3.33

*Rating: 1 = Low, 10 = H   Source: Vendor Interviews

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FAE2 P36

- Pricing of field service and spare requirements levels remain top areas of influence in 1982 as they were in 1981. Although the key issue governing response time, geographical marketing (or where the sales force is allowed to sell products), is still not heavily influenced by field service management, this is improving.

- Added emphasis was applied to contracts and sales in 1982, positioning field service to become more influential in defining and exploiting new business opportunities.

- A rating of below five underscores issues where field service management has minor influence, and a number of key field service issues are included:

    - Equipment specification.

    - Equipment design.

    - Order acceptance.

    - Serviceability design.

    - Site environment.

    - User education.

    - Diagnostics.

    - Geographical marketing.

- However, all of these issues improved their rating in 1982 over 1981, showing that the necessity of involving field service management in the issues has become apparent.

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4.   FIELD SERVICE PERFORMANCE, 1981, AND PLANS FOR 1983

●   The service provided to customers was measured for 10 categories of equipment by system availability, response time, repair time, and MTBF.

●   Current values and expectations for 1983 were obtained for each of these and (with the exception of MTBF) the vendor's own judgement of what users would accept as a minimum.

●   Exhibit IV-21 summarises the findings for system availability:

    -    Users' minimum requirements, as perceived by vendors, are exceeded in all categories of equipment except word processors, which currently have minimum acceptable availability.

    -    Vendors do not intend to improve 1983 availability for small systems, minicomputers, microcomputers, word processors, and executive work-stations.

    -    Modest improvements are expected in large and medium systems, peripherals, and terminals.

    -    Data communications is the only category where system availability is expected to decrease in 1983.

●   Next, average response times were examined.   Exhibit IV-22 analyses the findings. In each case the data refer to the vendor's view, not the user's:

    -    Only service vendors for microcomputers, peripherals, word processors, and executive workstations are within the user requirements.

    -    A user tolerance of 15-hour response time for peripherals reflects built-in system redundancies utilising peripheral switches.

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EXHIBIT IV-21

VENDORS' RESPONSE ON SYSTEM AVAILABILITY

EQUIPMENT CATEGORY	SYSTEM AVAILABILITY (percent)		
	CURRENT	ESTIMATE 1983	MINIMUM USER WOULD ACCEPT
Large Mainframes	97.7%	98.8%	97.0%
Medium Mainframe	97.4	97.8	94.9
Small Business Systems	98.5	98.5	97.3
Minicomputers	98.4	98.4	95.0
Microcomputers	97.0	97.0	96.0
Peripherals	98.1	98.5	95.0
Terminals	99.0	99.6	97.5
Word Processors	98.0	98.0	98.0
Executive Workstations	99.0	99.0	99.0
Data Communications	98.5	99.3	97.1

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EXHIBIT IV-22

VENDORS' VIEW OF RESPONSE TIME

EQUIPMENT CATEGORY	AVERAGE RESPONSE TIME (HOURS)		
	CURRENT	ESTIMATE 1983	USER EXPECTATION
Large Mainframes	2.0	2.0	1.5
Medium Mainframes	2.5	2.5	2.0
Small Business Systems	2.0	2.0	2.0
Minicomputers	2.8	2.5	1.5
Microcomputers	4.5	8.0	8.0
Peripherals	12.9	10.0	15.0
Terminals	3.5	4.0	3.5
Word Processors	3.0	4.0	4.0
Executive Workstations	3.0	4.0	4.0
Data Communications	7.3	3.8	8.0

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- The remainder of equipment response times are at or below minimum expectations with little improvement, and some degradation, expected in 1983.

- Lastly, vendor repair times and MTBF were examined, and Exhibit IV-23 summarises the findings:

  - Vendors of all equipment categories expect to equal or improve their repair times in 1983.

  - Average MTBF values show no significant improvement over 1981.

5. MOST SIGNIFICANT FIELD SERVICE ISSUES, 1981-1983

- The most significant issues and accomplishments reported by vendors for 1981 are quoted in Exhibit IV-24.

  - The main themes reflect successful identification and implementation of plans to address new technology, and customer as well as productivity pressures.

  - These statements also demonstrate the increasing stature and sophistication within business environments.

- The pressing problems of the future, as described in Exhibit IV-25, show that field service managers are perceptive in identifying and managing their own organisational and operating weaknesses.

  - The lack of remote diagnostic resources, previously noted, will be addressed by 42% of the respondents.

  - Pricing problems, including erosion, will be critical. Field service managers have focused on these and are, as usual, expected to derive suitable options and alternatives.

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EXHIBIT IV-23

VENDORS' RESPONSE ON REPAIR TIME AND
MEAN TIME BETWEEN FAILURES (MTBF)

EQUIPMENT CATEGORY	REPAIR TIME (hours)		AVERAGE MTBF (hours)
	CURRENT	ESTIMATE 1983	
Large Mainframes	2.9	2.4	600
Medium Mainframes	2.3	2.0	450
Small Business Systems	2.5	2.5	650
Minicomputers	3.8	3.0	450
Microcomputers	1.0	1.0	1,500
Peripherals	1.5	1.4	2,250
Terminals	3.0	1.5	2,825
Word Processors	3.5	2.0	650
Executive Workstations	1.0	1.0	2,000
Data Communications	1.2	1.1	3,375

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EXHIBIT IV-24

MOST SIGNIFICANT ISSUES,
1981

- 'For field service to become profitable.'

- 'Opening repair centre service points that include walk-in/ mail-in.'

- 'Seventy percent of repairs are now board exchange.'

- 'The awareness that field service can be a significant business opportunity.'

- 'The integration of micros into computing plans of major organisations.'

- 'Moving into more diverse fields of maintenance - taking on maintenance of other manufacturers' equipment.'

- 'Explosive growth and hiring high-level skills.'

- 'Setting up of regional support centres allowing quicker response to customers' software queries, thus giving a form of remote diagnostics.'

- 'Holding down maintenance costs to the user.'

- 'Training of engineers, spare parts - how they are controlled for low inventory, price pressures from customers, third-party maintenance, and remote diagnostics.'

- 'Escalating running costs - car hire, petrol costs, subsistence, etc. - requiring a certain amount of curtailment in expansion plans and substantial increase in engineer and department productivity.'

EXHIBIT IV-25

MOST SIGNIFICANT ISSUES,
1982-1983

- 'Remote diagnostics.' (42% of respondents)

- 'Maintenance price erosion.' (17% of respondents)

- 'Involvement in mini/micro products, incident management.'

- 'User first-level maintenance.'

- 'Aggressive marketing of maintenance.'

- 'Awareness that maintenance price increases will not substitute for bad business planning by maintenance organisations.'

- 'Costs and quality.'

- 'Improved reliability of products due to customer engineering getting involved at design stage.'

- 'To increase engineer productivity by moving engineers closer to customers and increasing repair staff productivity.'

- 'Increased use of mixed hardware.'

- 'Nothing that hasn't already happened.'

- New business areas have been highlighted previously, and field service groups are ready to identify and exploit these.

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APPENDIX A: UNITED KINGDOM USER DATABASE

APPENDIX A: UNITED KINGDOM USER DATABASE

A. COMPARISON: 1982 VERSUS 1981

- The 1982 U.K. user database incorporates data from 1981 as well as 1982 and thereby provides valuable planning information regarding trends and major changes in users' opinions.

- Significant variations between 1981 and 1982 are noted as follows:

  - While ICL and IBM continue to dominate the U.K. market, this dominance is gradually eroding as a result of newer and smaller mainframe vendors making inroads in the marketplace. Exhibit A-1 shows the market, as perceived by respondents to the survey, for maintenance.

  - Users are becoming more sensitive and more conservative about maintenance price increases. Exhibit A-2 shows this and the fact that they expect lesser price increases in the future.

  - Comparing serviceability (response and repair times), the actual median response and repair times decreased in nearly 70% of the cases, reflecting better methods of service and increased customer demand.

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RESPONDENTS' VIEW OF MAINFRAME MAINTENANCE VENDORS
IN THE UNITED KINGDOM

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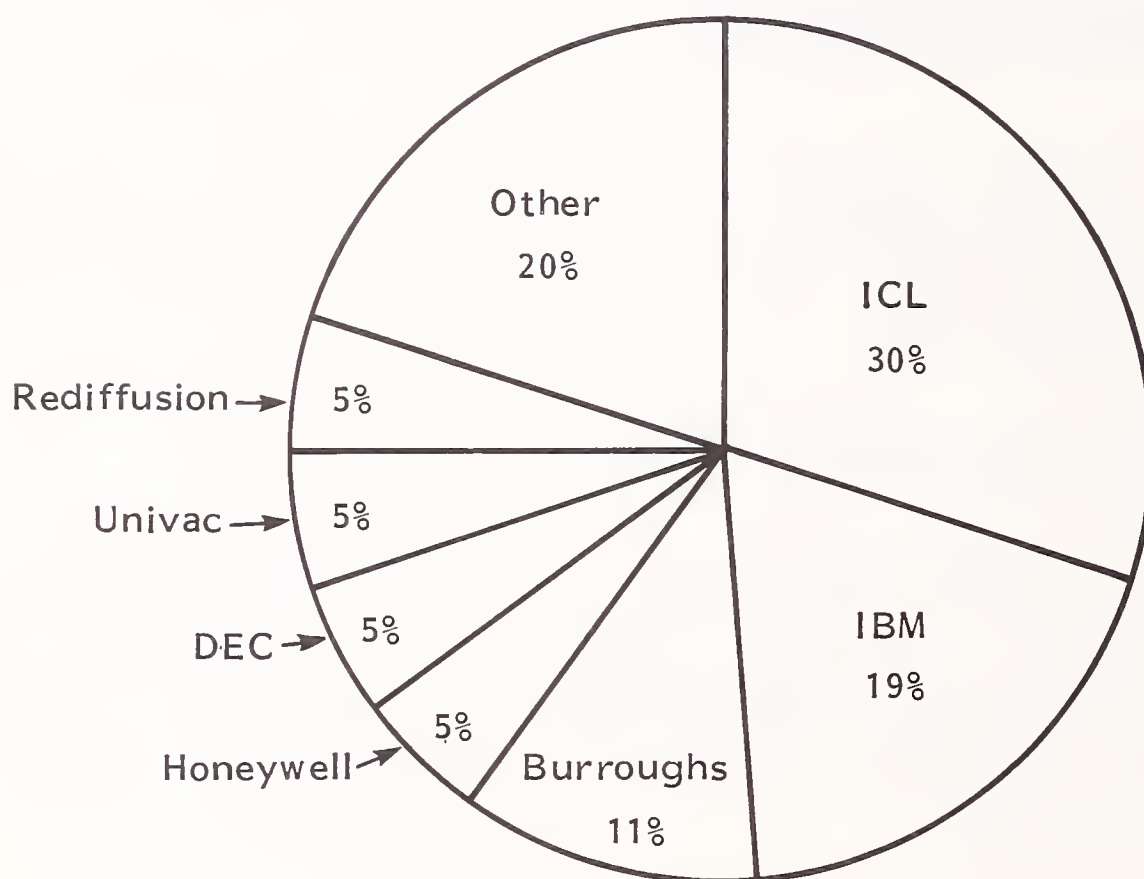
EXHIBIT A-2

USERS' SENSITIVITY REGARDING MAINTENANCE
PRICE INCREASES IN THE UNITED KINGDOM
(percent)

LEVEL OF INCREASE	1981	1982
Actual Increases As Perceived By Users (Last 12 Months)	11.5%	8.6%
Expected Increases (Next 12 Months)	10.5	8.2
Unacceptable Level Of Increase	15.3	9.6

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FAE2 P72

- Users expect to decrease their contracted shift coverage by 10% in 1982.

- Over half of the key maintenance issues were downgraded in importance to users. These were as follows:

    . Remote diagnostics.

    . User self-maintenance.

    . Preventive maintenance.

    . Stable engineer population.

    . Escalation procedures and price of maintenance.

- Remote diagnostics decreased in importance while increasing in quality, reflecting effective vendor development and implementation.

    . The reduced interest in the other issues means that users are less anxious about service than they were and are more concerned about their own internal problems.

- Software maintenance, systems and applications, had the most significant changes, all positive, in terms of perceived quality.

- Exhibit A-3 summarises key changes in the user database.

B.   KEY SERVICE ISSUES

- Exhibit A-4 provides a candid opinion from users regarding key maintenance issues.

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SIGNIFICANT CHANGES IN USERS' OPINIONS OF SERVICE QUALITY,
UNITED KINGDOM – 1982 VERSUS 1981

	SERVICE CATEGORY	PRODUCT CATEGORY	CHANGE*	CONCLUSIONS
POSITIVE	Remote Diagnostics	Systems Software Maintenance	+2.5	Vendors are doing a better job with software maintenance.
	Quality of Engineers' Management	Applications Software Maintenance	+2.4	
	Forecast of Quality of Maintenance in 1983	Applications Software Maintenance	+2.3	
	Quality of Engineer	Applications Software Maintenance	+2.1	
	Overall Quality of Maintenance	Applications Software Maintenance	+1.9	
	Forecast of Quality of Maintenance in 1983	Systems Software	+1.5	
	Remote Diagnostics	Medium System	+1.4	
	Remote Diagnostics	Peripherals	+1.3	
	Value for the Money (Maintenance)	Small Systems	+1.3	
	Value for the Money (Maintenance)	Applications Software	+1.2	
	Quality of Information	Applications Software	+0.8	
	Quality of Maintenance	Medium Systems	+0.7	
	Value for the Money (Maintenance)	Large Systems	+0.7	
NEGATIVE	Remote Diagnostics	Large Systems	-1.5	Lack of trained field engineers may be the problem for these negatives.
	Quality Engineers' Management	Small Systems	-1.2	
	Value for the Money (Maintenance)	Minicomputers	-1.1	
	Quality of Engineer	Minicomputers	-0.9	
	Quality of Information	Minicomputers	-0.8	
	Quality of Engineer	Small Systems	-0.6	

*On a Scale of 1 to 10

INPUT
FAE2 P73

EXHIBIT A-4

USER CONSENSUS REGARDING KEY SERVICES ISSUES FOR THE UNITED KINGDOM

CONCERN	USER REPLY
Guidelines for Evaluating Cost of Maintenance	'Performance', 'competitiveness', 'cost of moving to another supplier', 'percent of capital price', 'none', 'pay asking price', 'inflation rate'.
Attitude Towards Preventive Maintenance (PM)	Two-thirds of users feel PM is necessary (evil). The remainder feel neutral or negative about PM.
Users Receiving Maintenance Price Discount	11% do receive discounts. 89% do not receive discounts.
Attitude Towards Remote Diagnostics	61% of users feel positive about remote diagnostics. 23% are negative. 16% remaining are neutral.
Considering Third-Party Maintenance	Two-thirds of users are not considering third-party maintenance service because of a variety of reasons: vendor loyalty, fear, lack of spares. The others are considering third-party from a cost basis.
Annoyances Regarding Maintenance	'Lack of spares', 'recurring problems', 'downtime', 'it fails again right after they (field service) leave', 'blaming others', 'cost too hight', 'failure right after PM', 'lack of trained FE's', 'lack of follow-up on premises', 'lack of engineer understanding', 'repeat failures'.

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- Relatively few users (11%) receive maintenance discounts. Vendors in the U.K. should anticipate more pressures to discount service.

- One-third of U.K. users are contemplating third-party maintenance.

- Vendors should also beware that third-party maintenance may become more desirable and feasible as user firms grow restless with some manufacturers' service and pricing.

C.   USER SATISFACTION WITH MAINTENANCE

- Exhibits A-5 through A-12 provide specific details of user satisfaction with maintenance.

- Exhibits A-13 through A-20 indicate users' perception of service using a different comparison from, but the same data as, the previous analysis.

    - Users are generally satisfied with the overall quality of service.

    - All ratings are between average and excellent.

    - The lowest 1982 rating was 5.8 (5 = average) for other minicomputers. This results from the lack of trained technical resources where the demand for service engineers exceeds the supply.

    - The biggest improvement between 1982 and 1981 was in the overall quality of applications software maintenance. The rating went from 4.2 to 6.1, indicating vendors' responsiveness to users' requests for improved application support.

INPUT

USER SATISFACTION WITH MAINTENANCE OF LARGE MAINFRAME SYSTEMS IN THE UNITED KINGDOM

Overall Quality of Maintenance — 7.2 / 7.1

Quality of Engineers — 7.6 / 7.6

Quality of Engineers' Managers — 7.4 / 7.1

Availability of Spare Parts — 5.6 / 5.5

Quality of Information — 6.0 / 6.6

Remote Diagnostics — 6.8 / 5.3

Forecast of Quality of Maintenance Next Year — 7.2 / 7.3

Value for Money of Maintenance — 5.8 / 6.5

Rating

☐ = 1981

▨ = 1982

1 = Poor

5 = Average

10 = Excellent

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USER SATISFACTION WITH MAINTENANCE OF MEDIUM MAINFRAME SYSTEMS IN THE UNITED KINGDOM

Category	1981	1982
Overall Quality of Maintenance	7.0	7.0
Quality of Engineers	7.2	7.3
Quality of Engineers' Managers	7.0	6.9
Availability of Spare Parts	6.2	6.6
Quality of Information	5.6	6.3
Remote Diagnostics	5.0	6.4
Forecast of Quality of Maintenance Next Year	6.8	6.9
Value for Money of Maintenance	5.8	5.7

Rating

▨ = 1981

▨ = 1982

1 = Poor

5 = Average

10 = Excellent

INPUT
FAE2

USER SATISFACTION WITH MAINTENANCE OF SMALL BUSINESS SYSTEMS IN THE UNITED KINGDOM

Overall Quality of Maintenance — 7.0 / 6.9

Quality of Engineers — 7.2 / 6.6

Quality of Engineers' Managers — 7.4 / 6.2

Availability of Spare Parts — 6.8 / 6.5

Quality of Information — 5.4 / 5.7

Remote Diagnostics — 7.6 / No Response

Forecast of Quality of Maintenance Next Year — 7.4 / 7.1

Value for Money of Maintenance — 5.8 / 7.1

Rating

☐ = 1981

▨ = 1982

1 = Poor

5 = Average

10 = Excellent

INPUT
FAE2

USER SATISFACTION WITH MAINTENANCE OF OTHER MINICOMPUTERS IN THE UNITED KINGDOM

	Rating
Overall Quality of Maintenance	6.4 / 5.8
Quality of Engineers	6.6 / 5.7
Quality of Engineers' Managers	6.6 / 6.2
Availability of Spare Parts	6.0 / 5.5
Quality of Information	5.8 / 5.0
Remote Diagnostics	6.0 / No Response
Forecast of Quality of Maintenance Next Year	6.4 / 5.4
Value for Money of Maintenance	5.6 / 4.5

Rating

☐ = 1981

▨ = 1982

1 = Poor

5 = Average

10 = Excellent

INPUT
FAE2

USER SATISFACTION WITH MAINTENANCE OF PERIPHERALS
IN THE UNITED KINGDOM

Category		Rating

Overall Quality of Maintenance — 7.2 / 7.4

Quality of Engineers — 7.4 / 7.1

Quality of Engineers' Managers — 7.4 / 7.1

Availability of Spare Parts — 6.6 / 7.0

Quality of Information — 6.2 / 6.2

Remote Diagnostics — 6.0 / 7.3

Forecast of Quality of Maintenance Next Year — 7.4 / 7.4

Value for Money of Maintenance — 6.4 / 5.9

Rating scale: 0 2 4 6 8 10

Rating

☐ = 1981
▨ = 1982

1 = Poor
5 = Average
10 = Excellent

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USER SATISFACTION WITH MAINTENANCE OF TERMINALS
IN THE UNITED KINGDOM

Overall Quality of Maintenance		7.2 / 7.0
Quality of Engineers		7.4 / 6.9
Quality of Engineers' Managers		7.4 / 6.7
Availability of Spare Parts		6.8 / 6.7
Quality of Information		5.8 / 5.8
Remote Diagnostics	No Mentions	6.1
Forecast of Quality of Maintenance Next Year		7.2 / 7.0
Value for Money of Maintenance		5.8 / 5.7

Rating

☒ = 1981

■ = 1982

1 = Poor
5 = Average
10 = Excellent

INPUT
FAE2

USER SATISFACTION WITH MAINTENANCE OF SYSTEMS SOFTWARE
IN THE UNITED KINGDOM

Overall Quality of Maintenance — 6.8 / 6.9

Quality of Engineers — 6.8 / 7.0

Quality of Engineers' Managers — 7.0 / 6.8

Availability of Spare Parts — Not Applicable / 7.1

Quality of Information — 6.2 / 5.9

Remote Diagnostics — 4.8 / 7.3

Forecast of Quality of Maintenance Next Year — 6.4 / 7.9

Value for Money of Maintenance — 6.0 / 5.6

Rating

☐ = 1981
▨ = 1982

1 = Poor
5 = Average
10 = Excellent

INP
FAE2

EXHIBIT A-12

USER SATISFACTION WITH MAINTENANCE OF APPLICATIONS SOFTWARE
IN THE UNITED KINGDOM

Category	1981	1982
Overall Quality of Maintenance	4.2	6.1
Quality of Engineers	4.0	6.1
Quality of Engineers' Managers	4.2	6.6
Availability of Spare Parts	Not Applicable	7.1
Quality of Information	5.0	5.8
Remote Diagnostics	None	9.0
Forecast of Quality of Maintenance Next Year	4.2	6.5
Value for Money of Maintenance	4.4	5.6

Rating

☐ = 1981
▦ = 1982

1 = Poor
5 = Average
10 = Excellent

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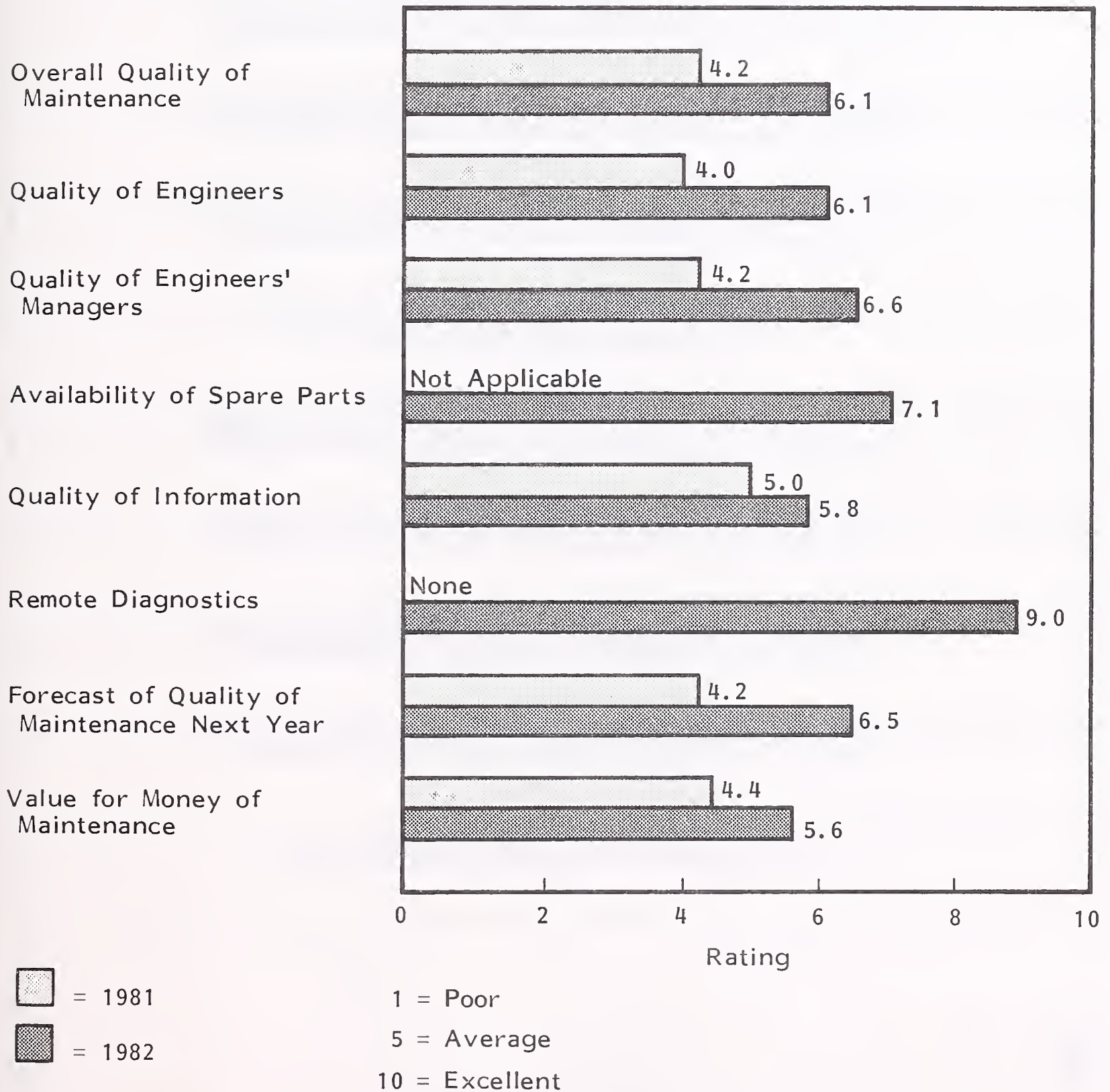
EXHIBIT A-13

USERS' RATING OF OVERALL QUALITY OF MAINTENANCE
IN THE UNITED KINGDOM

Category	1981	1982
Large Mainframe Systems	7.2	7.1
Medium Mainframe Systems	7.0	7.0
Small Business Systems	7.0	6.9
Other Minicomputers	6.4	5.8
Peripherals	7.2	7.4
Terminals	7.2	7.0
Word Processors	7.2	7.0
Systems Software	6.8	6.9
Applications Software	4.2	6.1

Rating axis: 0, 2, 4, 6, 8, 10 — Rating

☐ = 1981
▨ = 1982

1 = Poor/Low
5 = Average
10 = Excellent/High

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USERS' RATING OF QUALITY OF ENGINEERS IN THE UNITED KINGDOM

	Rating
Large Mainframe Systems	7.6 / 7.6
Medium Mainframe Systems	7.2 / 7.3
Small Business Systems	7.2 / 6.6
Other Minicomputers	6.6 / 5.7
Peripherals	7.4 / 7.1
Terminals	7.0 / 6.9
Word Processors	6.0 / 7.0
Systems Software	6.8 / 7.0
Applications Software	No Mentions / 6.1

Rating

= 1981
= 1982

1 = Poor/Low
5 = Average
10 = Excellent/High

INPUT
FAE2 P76

EXHIBIT A-15

USERS' RATING OF QUALITY OF ENGINEERS' MANAGERS
IN THE UNITED KINGDOM

	Rating
Large Mainframe Systems	7.4 / 7.1
Medium Mainframe Systems	7.0 / 6.9
Small Business Systems	7.4 / 6.2
Other Minicomputers	6.6 / 6.2
Peripherals	7.4 / 7.1
Terminals	7.2 / 6.7
Word Processors	6.2 / 6.5
Systems Software	7.0 / 6.8
Applications Software	No Mentions / 6.6

☐ = 1981

▨ = 1982

1 = Poor/Low

5 = Average

10 = Excellent/High

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EXHIBIT A-16

USERS' RATING OF AVAILABILITY OF SPARE PARTS
IN THE UNITED KINGDOM

Category	1981	1982
Large Mainframe Systems	5.6	5.5
Medium Mainframe Systems	6.2	6.6
Small Business Systems	6.8	6.5
Other Minicomputers	6.0	5.5
Peripherals	6.6	7.0
Terminals	6.8	6.7
Word Processors	6.2	6.4
Systems Software	Not Applicable	
Applications Software	Not Applicable	

Rating

▢ = 1981

▨ = 1982

1 = Poor/Low

5 = Average

10 = Excellent/High

- III -

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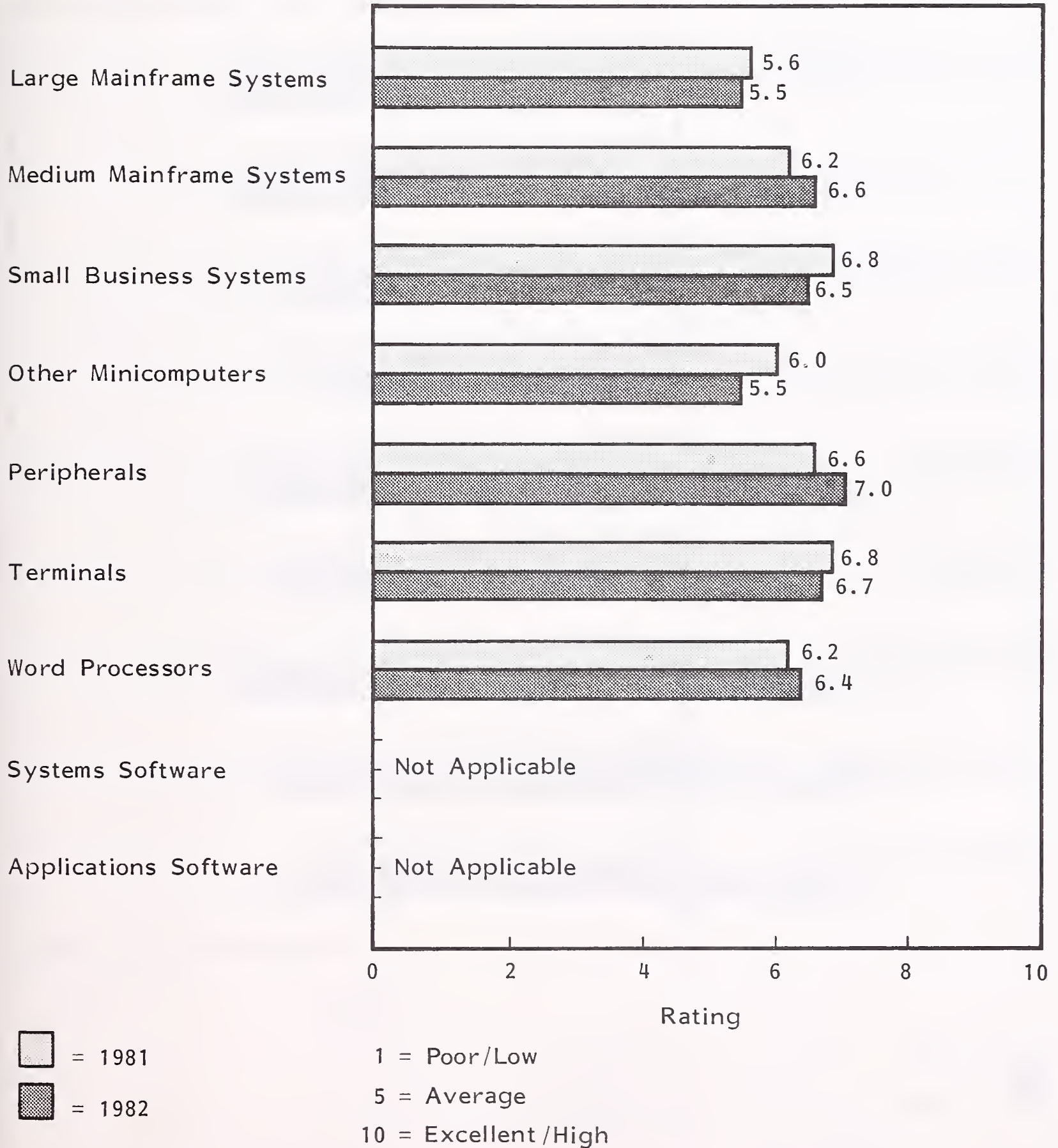
EXHIBIT A-17

USERS' RATING OF QUALITY OF INFORMATION
IN THE UNITED KINGDOM

Category	1981	1982
Large Mainframe Systems	6.0	6.6
Medium Mainframe Systems	5.6	6.3
Small Business Systems	5.4	5.7
Other Minicomputers	5.8	5.0
Peripherals	6.2	6.2
Terminals	5.8	5.8
Word Processors	6.4	6.5
Systems Software	6.2	5.9
Applications Software	5.0	5.8

Rating

☐ = 1981
▨ = 1982

1 = Poor/Low
5 = Average
10 = Excellent/High

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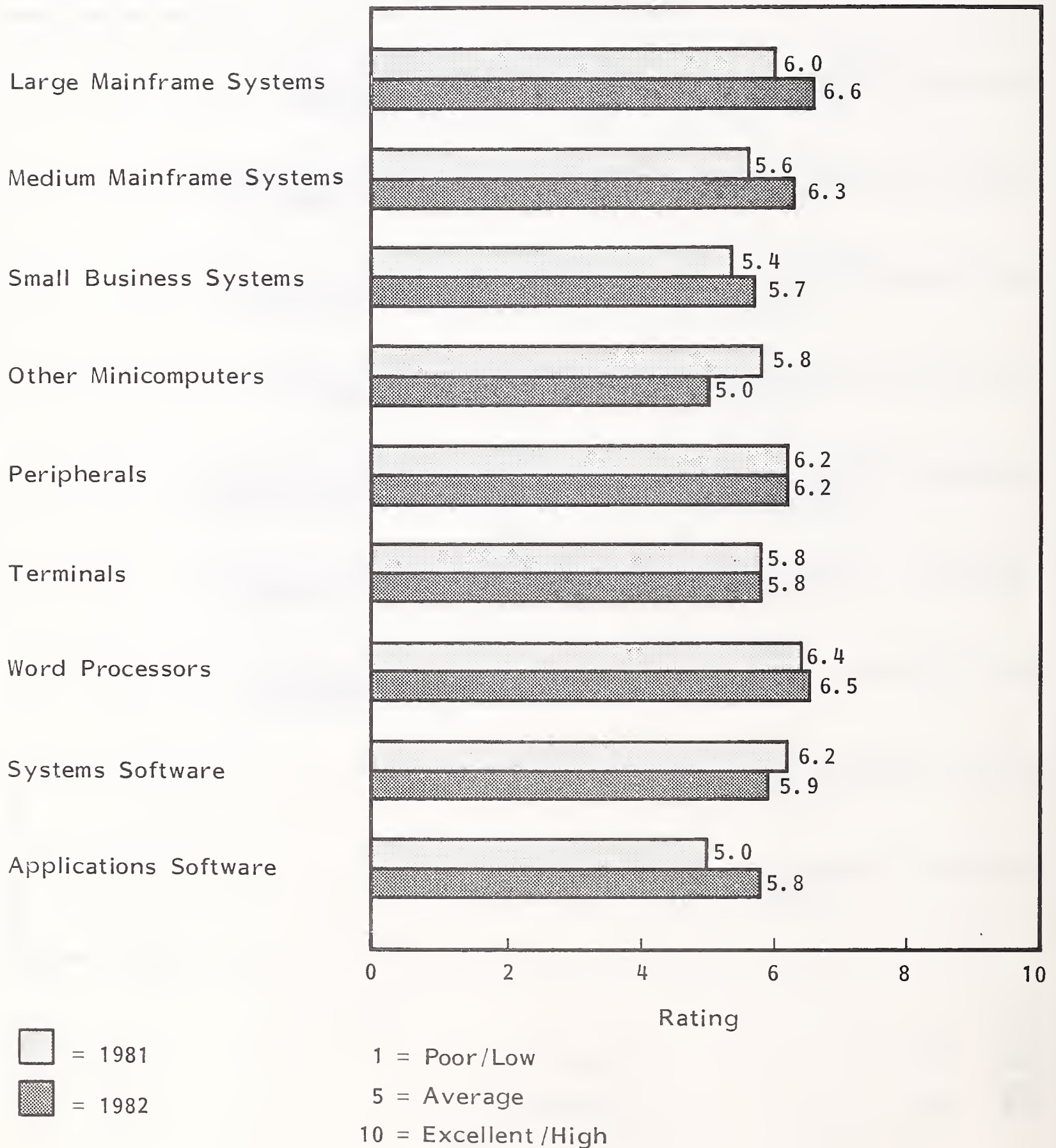
EXHIBIT A-18

USERS' RATING OF REMOTE DIAGNOSTICS IN THE UNITED KINGDOM

Large Mainframe Systems — 6.8 (1982), 5.3 (1983)
Medium Mainframe Systems — 5.0 (1982), 6.4 (1983)
Small Business Systems — 7.6 (1982), No Mentions (1983)
Other Minicomputers — 6.0 (1982), No Mentions (1983)
Peripherals — 6.0 (1982), 7.3 (1983)
Terminals — No Mentions (1982), 6.1 (1983)
Word Processors — No Mentions (1982), 7.0 (1983)
Systems Software — 4.8 (1982), 7.3 (1983)
Applications Software — No Mentions (1982), 7.0 (1983)

Rating

☐ = 1982
▨ = 1983

1 = Poor/Low
5 = Average
10 = Excellent/High

INPUT
FAE2 P80

EXHIBIT A-19

USERS' RATING OF QUALITY OF MAINTENANCE
IN THE UNITED KINGDOM

Category	1982	1983
Large Mainframe Systems	7.2	7.3
Medium Mainframe Systems	6.8	6.9
Small Business Systems	7.4	7.1
Other Minicomputers	6.0	5.4
Peripherals	7.4	7.4
Terminals	7.2	7.0
Word Processors	7.0	6.9
Systems Software	6.4	7.9
Applications Software	4.2	6.5

Rating

☐ = 1982
▦ = 1983

1 = Poor/Low
5 = Average
10 = Excellent/High

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FAE2
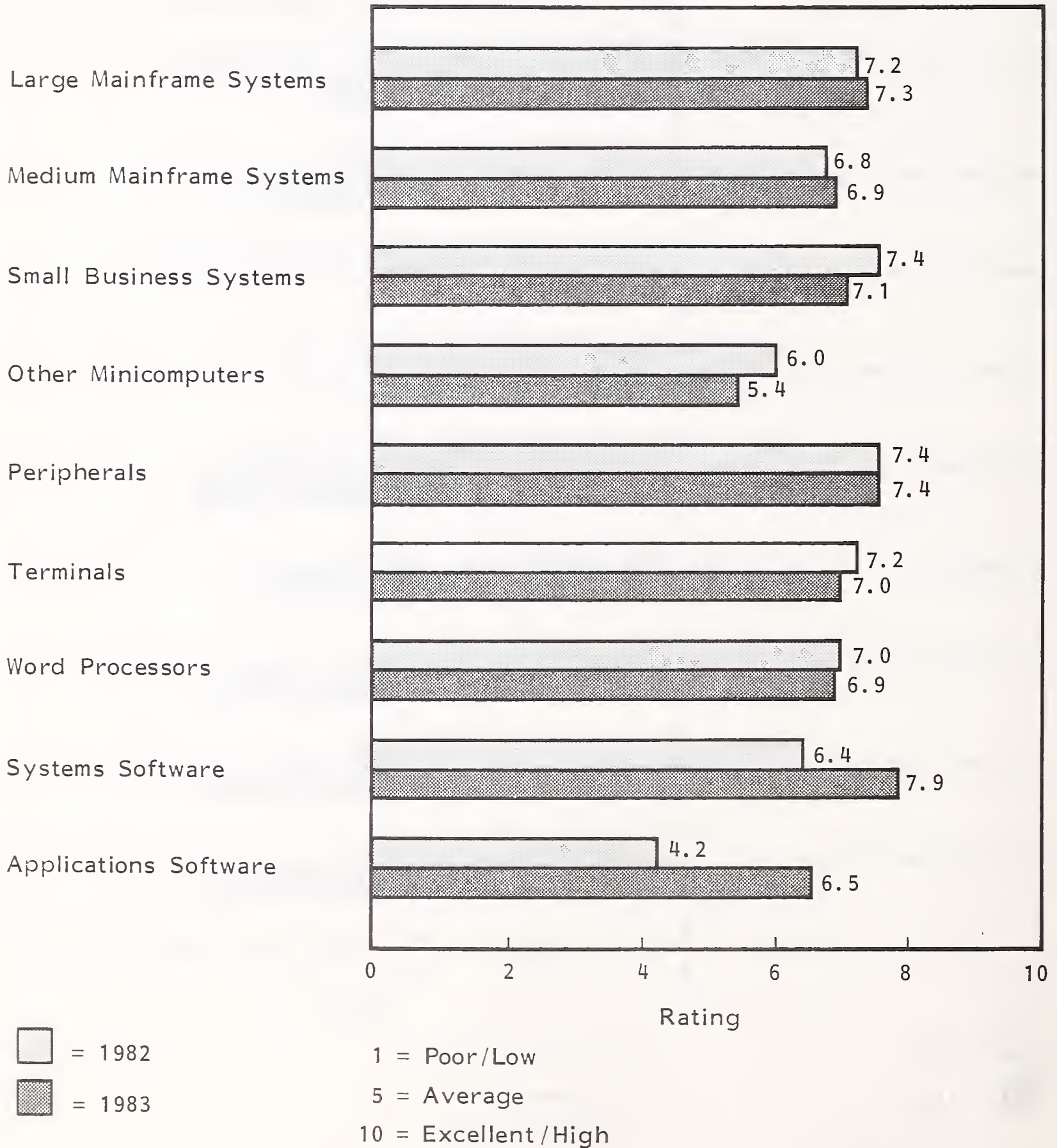
EXHIBIT A-20

USERS' RATING OF VALUE FOR MONEY OF MAINTENANCE
IN THE UNITED KINGDOM

Large Mainframe Systems — 5.8 (1981), 6.5 (1982)
Medium Mainframe Systems — 5.6 (1981), 5.7 (1982)
Small Business Systems — 6.0 (1981), 5.9 (1982)
Other Minicomputers — 5.2 (1981), 4.5 (1982)
Peripherals — 6.4 (1981), 5.9 (1982)
Terminals — 6.2 (1981), 5.7 (1982)
Word Processors — 5.8 (1981), 4.5 (1982)
Systems Software — 6.0 (1981), 5.6 (1982)
Applications Software — 4.4 (1981), 5.6 (1982)

Rating

☐ = 1981
▦ = 1982

1 = Poor/Low
5 = Average
10 = Excellent

INPUT
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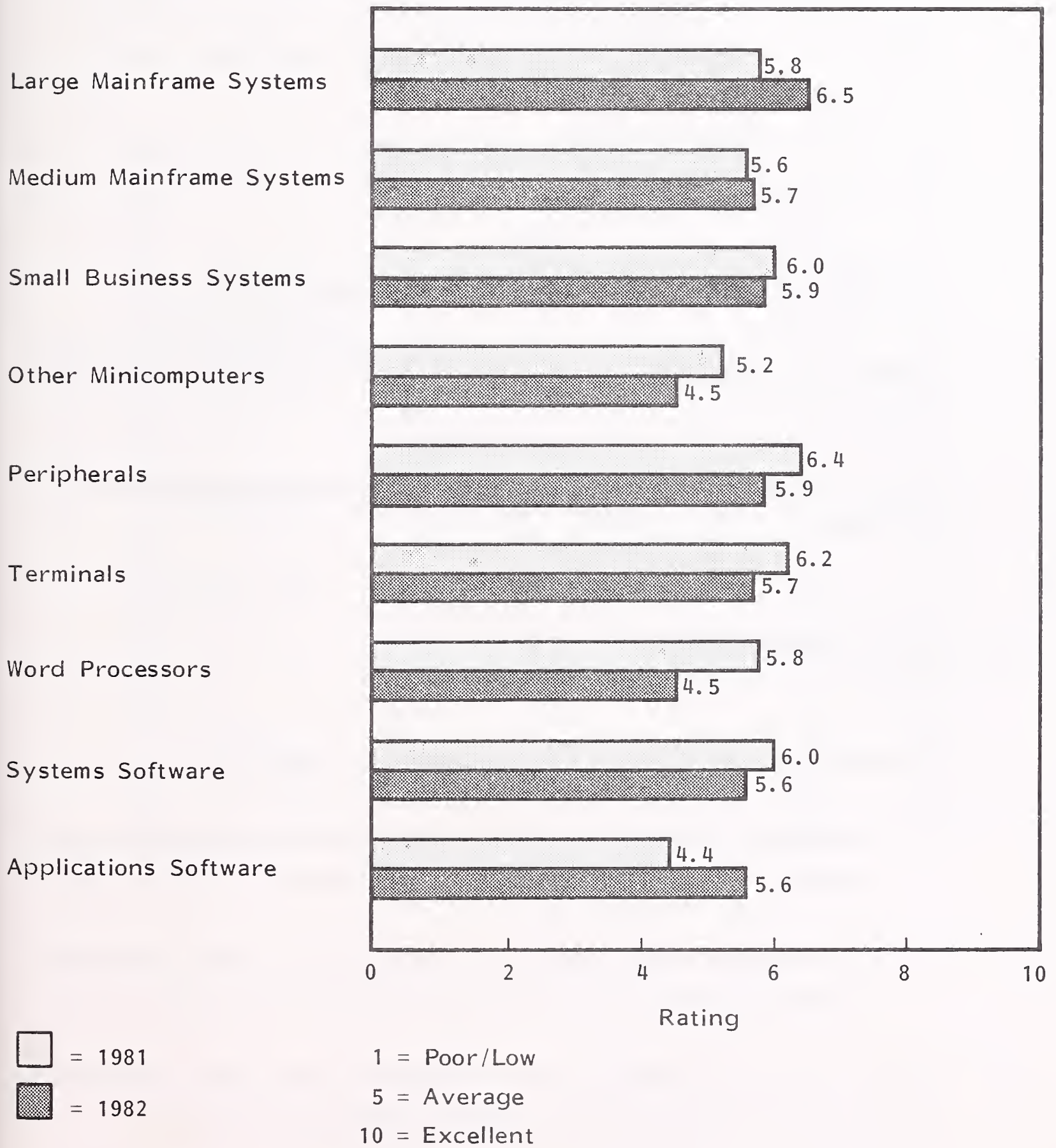
D.   SERVICEABILITY

- Serviceability, as viewed by the user, is the time it takes the maintainer to respond to a problem and the time it takes to repair the fault once he arrives.

- Exhibits A-21 through A-28 show comparative response and repair times:

    - By year, 1982 versus 1981.

    - By range and median.

    - By preferred, actual, and minimum/maximum times.

- Response times generally are within two hours, even for peripheral and smaller equipment.

- Repair times have improved, reflecting more on-site board swapping and off-site repair.

E.   OTHER PLANNING DATA

- Exhibit A-29 illustrates users' perceptions of systems availability.

    - In three product areas, small systems, other minicomputers, and peripherals, system availability is less than the user is willing to accept.

    - For large and medium systems, terminals, word processors, and systems software, systems availability exceeds minimum expectations of users.

- Exhibit A-30 shows a sharp change in thinking by users about maintenance pricing. Vendors should note this increased sensitivity to pricing.

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USERS' PERCEPTION OF SERVICEABILITY FOR LARGE SYSTEMS IN THE UNITED KINGDOM

SERVICE	TIME IN HOURS			
	1981		1982	
	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0.50-2.50	0.50	0.25-2.0	1.0
Actual	0.50-4.0	1.0	0.25-2.0	2.0
Minimum Acceptable	0.50-5.0	2.0	2.0-4.0	2.0
Repair Time				
Preferred	0.50-4.0	0.50	0.25-2.0	1.0
Actual	0.50-5.0	1.50	0.25-1.0	0.25
Maximum Acceptable	0.50-5.0	2.0	1.0-4.0	1.0

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USERS' PERCEPTION OF SERVICEABILITY FOR MEDIUM MAINFRAMES
IN THE UNITED KINGDOM

	TIME IN HOURS			
	1981		1982	
SERVICE	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0.50-4.0	1.0	0.25-4.0	1.0
Actual	0.50-5.0	2.0	0.50-24.0	2.0
Minimum Acceptable	0.50-5.0	3.0	1.75-24.0	3.0
Repair Time				
Preferred	0.50-3.50	0.75	0.25-2.0	2.0
Actual	0.50-6.0	1.75	0.25-4.0	1.0
Maximum Acceptable	0.50-6.0	3.25	1.0-4.0	2.0

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FAE2

USERS' PERCEPTION OF SERVICEABILITY FOR SMALL BUSINESS SYSTEMS IN THE UNITED KINGDOM

	TIME IN HOURS			
	1981		1982	
SERVICE	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0.25-9.0	2.0	1.0-4.0	1.0
Actual	0.25-10.0	3.0	1.0-6.0	2.0
Minimum Acceptable	2.0-10.0	5.0	2.0-24.0	4.0
Repair Time				
Preferred	0.50-6.0	1.25	0.50-24.0	2.0
Actual	1.0-6.0	1.50	0.50-11.0	2.0
Maximum Acceptable	1.50-6.0	3.50	0.50-24.0	4.0

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FAE2

EXHIBIT A-24

USERS' PERCEPTION OF SERVICEABILITY FOR OTHER MINICOMPUTERS
IN THE UNITED KINGDOM

| | TIME IN HOURS | | | |
| | 1981 | | 1982 | |
SERVICE	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0.33-6.0	2.0	1.0-4.0	1.0
Actual	0.75-10.0	3.0	2.0-6.0	3.0
Minimum Acceptable	2.0-10.0	4.0	3.0-24.0	10.0
Repair Time				
Preferred	0.50-4.0	1.0	0.50-48.0	4.0
Actual	0.50-6.0	2.0	0.50-4.0	1.0
Maximum Acceptable	1.0-6.0	4.0	2.0-24.0	2.0

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FAE2

USERS' PERCEPTION OF SERVICEABILITY FOR PERIPHERALS
IN THE UNITED KINGDOM

SERVICE	TIME IN HOURS			
	1981		1982	
	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0.50-6.0	1.50	0.50-2.0	2.0
Actual	0.50-6.0	2.50	0.50-2.0	2.0
Minimum Acceptable	0.50-6.0	4.0	1.0-2.50	2.0
Repair Time				
Preferred	0.50-4.0	1.0	0.25-3.0	1.0
Actual	0.50-6.0	2.0	0.25-1.0	1.0
Maximum Acceptable	0.50-6.0	4.0	1.0-4.0	1.50

INPUT
FAE2

EXHIBIT A-26

USERS' PERCEPTION OF SERVICEABILITY FOR TERMINALS
IN THE UNITED KINGDOM

	TIME IN HOURS			
	1981		1982	
SERVICE	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0.33-9.0	2.0	0.50-4.0	2.0
Actual	0.50-12.0	4.0	0.50-12.0	2.0
Minimum Acceptable	0.75-12.0	8.0	1.0-4.0	4.0
Repair Time				
Preferred	0.50-6.0	0.75	0.50-3.0	1.0
Actual	0.50-6.0	1.50	0.25-1.0	1.0
Maximum Acceptable	0.50-6.0	4.0	1.0-8.0	2.0

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USERS' PERCEPTION OF SERVICEABILITY FOR WORD PROCESSORS IN THE UNITED KINGDOM

	TIME IN HOURS			
	1981		1982	
SERVICE	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0.25-9.0	2.0	0.25-4.0	1.0
Actual	0.50-12.0	4.0	0.25-1.0	1.0
Minimum Acceptable	2.0-12.0	4.0	2.0-4.0	3.0
Repair Time				
Preferred	0.50-4.0	1.0	1.0-2.0	1.0
Actual	1.0-6.0	2.0	0.50-1.0	1.0
Maximum Acceptable	1.0-6.0	3.0	1.50-4.0	2.0

INPUT
FAE2

USERS' PERCEPTION OF SERVICEABILITY FOR SYSTEMS SOFTWARE
IN THE UNITED KINGDOM

	TIME IN HOURS			
	1981		1982	
SERVICE	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0.50-12.0	4.0	2.0-8.0	1.0
Actual	0.50-12.0	4.50	1.0-2.0	2.0
Minimum Acceptable	2.0-12.0	9.0	1.0-8.0	9.0
Repair Time				
Preferred	1.0-12.0	5.0	1.0-2.0	1.0
Actual	1.0-12.0	7.0	1.0-4.0	2.0
Maximum Acceptable	1.0-12.0	10.0	1.0-4.0	2.0

EXHIBIT A-29

UNITED KINGDOM RESPONDENTS' VIEW OF
SYSTEM AVAILABILITY

(percent)

CLASSIFICATION	CURRENTLY GETTING		IDEALLY WOULD LIKE		MINIMUM WOULD ACCEPT		PERCENT INCREASE WOULD PAY FOR IDEAL	
	1981	1982	1981	1982	1981	1982	1981	1982
Large Mainframe Systems	96.8%	96.7%	98.8%	99.1%	92.7%	93.4%	10.8%	15%
Medium Mainframe Systems	96.5	94.8	98.8	96.9	94.5	94.8	20	17
Small Business Systems	90	91.5	98.7	99.3	92.5	94.5	15	22
Other Minicomputers	93.8	92.4	98.6	98.8	91	94.8	31	20
Peripherals	96.2	93.3	99	94.5	94.9	95.2	21	15
Terminals	97.2	92.9	98.9	97.5	93.9	88.7	28	17
Word Processors	94.5	97.4	99	99.4	95.7	96.2	32	N/A
Systems Software	97	98.3	99	95.2	97	94.5	30	22
Applications Software	92	97.0	98.6	100	96	97	75	0

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INPUT
FAE2 P82

RESPONDENTS' PRICE INCREASES AND FORECASTS
IN THE UNITED KINGDOM

SYSTEM AVAILABILITY (percent)	PERCENT INCREASE IN LAST 12 MONTHS		FORECAST INCREASE EXPECTED IN NEXT 12 MONTHS		PERCENT INCREASE THAT WOULD BE UNACCEPTABLE	
CLASSIFICATION	1981	1982	1981	1982	1981	1982
Large Mainframe Systems	11.3%	8.7%	11 %	7.8%	15.8%	8.8%
Medium Mainframe Systems	13.4	12.2	10.4	9.1	16.4	12.0
Small Business Systems	10.5	8.7	10.1	8.4	14.4	12.6
Other Minicomputers	11	5.0	11.5	10.0	16.2	10.0
Peripherals	11.3	8.0	10.9	8.0	16.5	11.2
Terminals	10.3	8.9	9.8	8.7	13.6	10.2
Word Processors	9.9	7.0	9.3	12.0	14.5	10.0
Systems Software	10.9	10.0	9.7	7.0	14.7	6.3
Applications Software	N/A	N/A	11.6	3.0	15.6	5.0

INPUT
FAE2

- Exhibit A-31 records vendors' responses to maintenance issues and their importance.

    - Over half the issues decreased in importance from 1981 to 1982.

    - This reflects users' concerns about their own internal problems and is a vote of confidence to vendors to manage their own issues.

- Exhibit A-32 provides shifts of maintenance compared to shifts of usage. A 10% reduction in contracted maintenance is expected.

INPUT

EXHIBIT A-31

USERS' RATING OF IMPORTANCE OF
MAINTENANCE ISSUES IN THE UNITED KINGDOM

MAINTENANCE ISSUES	ASKED IN 1981		ASKED IN 1982	
	1981	1983	1982	1984
System Availability	9.9	9.9	9.5	9.6
Response Time	8.9	9.2	8.9	9.2
Repair Time	8.9	8.9	8.6	8.7
Preventive Maintenance	7.6	7.3	6.1	5.8
Remote Maintenance	8.6	8.6	4.5	5.0
Escalation Procedures	7.9	8.3	6.8	6.9
Price of Maintenance	8.6	8.9	7.5	7.9
Stable Engineer Population	8.3	7.6	7.0	7.0
Uptime Guarantees	6.9	7.3	7.0	7.2
Equipment Reliability	9.6	9.9	9.3	9.5
Support Centres	5.9	7.3	6.3	6.5
Software Maintenance	7.9	8.9	7.1	7.6
Flexible Contract	5.9	7.3	5.2	5.4
User Self-Maintenance	5.3	6.3	3.7	4.1

1 = Unimportant
5 = Average
10 = Important

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EXHIBIT A-32

RESPONDENTS' AVERAGE CONTRACTED MAINTENANCE PERIOD VERSUS
ACTUAL EQUIPMENT USAGE, 1981 AND 1982, IN THE UNITED KINGDOM

MAINTENANCE PERIOD AND EQUIPMENT USAGE	LARGE MAINFRAME SYSTEMS		MEDIUM MAINFRAME SYSTEMS		SMALL BUSINESS SYSTEMS		OTHER MINICOMPUTERS		PERIPHERALS		TERMINALS		WORD PROCESSORS	
	1981	1982	1981	1982	1981	1982	1981	1982	1981	1982	1981	1982	1981	1982
Contracted Maintenance (Number of Shifts)	2.3	2.0	1.5	1.3	1.3	1.2	1.2	1.2	1.9	1.6	1.2	1.2	1.1	1.0
Equipment Usage (Number of Shifts)	2.8	2.6	2.0	2.2	1.4	1.6	1.7	1.6	2.1	1.9	1.5	1.6	1.3	1.3
Contracted Maintenance Forecast Next Year (Number of Shifts)	2.3	2.2	1.5	1.3	1.4	1.2	1.2	1.2	1.9	1.6	1.2	1.2	1.1	1.0
Forecast Equipment Usage Next Year (Number of Shifts)	2.7	2.8	2.0	2.3	1.5	1.6	1.7	1.6	2.1	1.8	1.6	1.7	1.3	1.0
Contracted Number of Days Per Week	5.4	5.5	5.0	5.0	5.1	5.0	5.2	5.0	5.5	5.0	5.1	5.0	5.0	5.0
Actual Usage, (Days per Week)	5.7	5.0	5.0	5.0	5.1	5.2	5.5	5.2	5.5	5.2	5.4	4.6	5.0	5.0
Contracted Number of Days per Week Next Year	5.4	5.0	5.0	5.0	5.2	5.0	5.2	5.0	5.5	5.0	5.1	5.0	5.0	5.0
Forecast Usage (Days per Week) Next Year	5.7	5.5	6.0	5.2	5.2	5.6	5.5	5.4	5.5	5.1	5.4	5.3	5.0	5.0

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APPENDIX B: WEST GERMAN USER DATABASE

APPENDIX B: WEST GERMAN USER DATABASE

A. COMPARISON: 1982 VERSUS 1981

- INPUT's assessment of West German users indicates a healthy, competitive market place, in terms of maintenance services. According to research, vendors have been generally responsive to users' needs.

- Market share, as represented by users, is shown in Exhibit B-1.

    - Significant changes occurring between 1981 and 1982 include the following:

        . IBM's share has shrunk from 67% to 37%.

        . Siemens has increased its share from 14% to 22%.

        . NCR and Honeywell have increased market shares by 6% and 4% respectively.

    - The purpose of this report is to discuss and analyse maintenance issues, trends, and data. Market share information is not intended to provide accurate analysis but a general view from users.

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RESPONDENTS' VIEW OF MAINFRAME
MAINTENANCE VENDORS IN WEST GERMANY

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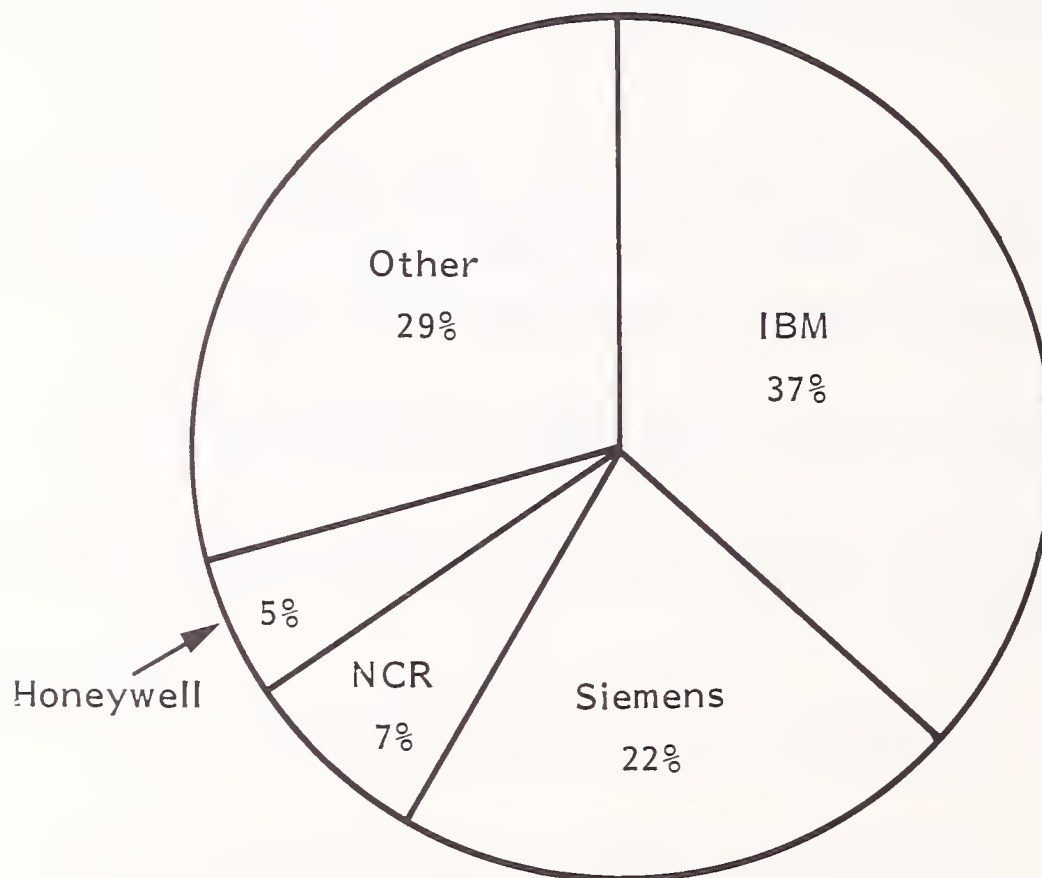
- West German users, like many of their European neighbours, are becoming more sensitive to maintenance costs. Exhibit B-2 indicates that users are anticipating a reduced rate (4.5%) of maintenance price increase in 1982 compared to 1981 (5.2%).

- Contracted maintenance shift coverage, according to users, is expected to drop by 13%, from 1.5 shifts to 1.3 shifts.

- Notwithstanding the perceived improvement of the quality of service, in cases where 89% of user satisfaction parameters improved, serviceability (response and repair times) fell in 1982 from 1981 levels.

    - Sixty-three percent of equipment/software categories showed a slower response than in 1981.

    - Fifty percent of these categories experienced an increase in repair time.

- This explains why 57% of the maintenance issues evaluated by users increased in importance. These included:

    - Software maintenance, up 51% in importance.

    - Price of maintenance, up 38% in importance.

    - Up-time guarantees, up 9% in importance.

    - System availability, up 7% in importance.

B. GENERAL APPRAISAL OF THE WEST GERMAN MAINTENANCE MARKET

- The quality of service in West Germany has improved markedly, as shown in Exhibit B-3.

INPUT

EXHIBIT B-2

USERS' SENSITIVITY REGARDING MAINTENANCE PRICE INCREASES IN WEST GERMANY

LEVEL OF INCREASE	1981	1982
Actual Increases As Perceived By Users (Last 12 Months)	6.0%	6.3%
Expected Increases (Next 12 Months)	5.2	4.5
Unacceptable Level Of Increase	8.2	8.1

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EXHIBIT B-3

SIGNIFICANT CHANGES IN USERS' OPINIONS OF SERVICE QUALITY,

WEST GERMANY - 1982 VERSUS 1981

	SERVICE CATEGORY	PRODUCT CATEGORY	CHANGE	CONCLUSIONS
POSITIVE	Availability of Spare Parts	All	+0.8 to +4.8	There was obviously a spare parts problem in Germany in 1981 which has been appropriately recognised and addressed by field service managers in Germany (as have the other items here).
	Quality of Maintenance Overall	Large, Medium Systems, Peripherals, Word Processors	+1.3 to +2.2	
	Quality of Engineers	Large, Medium Systems, Peripherals, Word Processors	+1.3 to +2.2	
	Remote Diagnostics	Medium Systems	+4.4	
	Forecast Quality of Maintenance Next Year	Large, Medium Systems, and Word Processors	+1.0 to +2.9	
	Value of Maintenance	Large, Medium, Other Mini-computer Systems, and Word Processors	+0.8 to +2.4	
	Quality of Information	Other Minicomputers and Terminals	+1.2 to +1.9	

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FAE2 P88

- Responses to key service issues are routine except for two areas, as shown in Exhibit B-4:

    - INPUT changed the normal query regarding preventive maintenance into: 'Is there anything you would like to be changed?' (about service); 62% said 'no.'

    - Forty-eight percent of the West German market might be interested in third-party maintenance.

- Exhibit B-5 through B-13 provide details of West German users' satisfaction with maintenance.

- Exhibit B-14 through B-21 indicate trends in serviceability, and response and repair times.

- System availability experience and tolerances are included in Exhibit B-22.

- Sensivity to pricing and contract maintenance/equipment usage data are described in Exhibits B-23 and B-24 respectively.

- Finally, users' ratings of maintenance issues are tabulated in Exhibit B-25.

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USER CONSENSUS REGARDING KEY SERVICE ISSUES FOR WEST GERMANY

CONCERN	USER REPLY
Guidelines for Evaluating Cost of Maintenance	'Labor intensive costs', 'previous costs', 'standard wage increases', 'IBM guidelines', 'competition', 'maintenance contracts', 'historical records'.
Is There Anything You Would Like Changed?	'Cutting down on petty dealings', '24 hour service', 'fixed response time'. 62% said no.
Users Receiving Maintenance Price Discount	Only 5% receive discounts.
Attitude Towards Remote Diagnostics	58% feel positive about remote diagnostics; 25% are neutral; 17% are negative or skeptical. Security 'is a significant factor'.
Considering Third-Party Maintenance	11% are in favor. 37% are neutral. 52% are negative.
Annoyances Regarding Maintenance	'High costs', 'long wait – unqualified engineers – spare parts unavailable', 'hardware: OK – software: too many costs', 'spare parts lack', 'response time – spare parts'. 25% are annoyed at lack of spares.

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USER SATISFACTION WITH MAINTENANCE OF
LARGE MAINFRAME SYSTEMS IN WEST GERMANY

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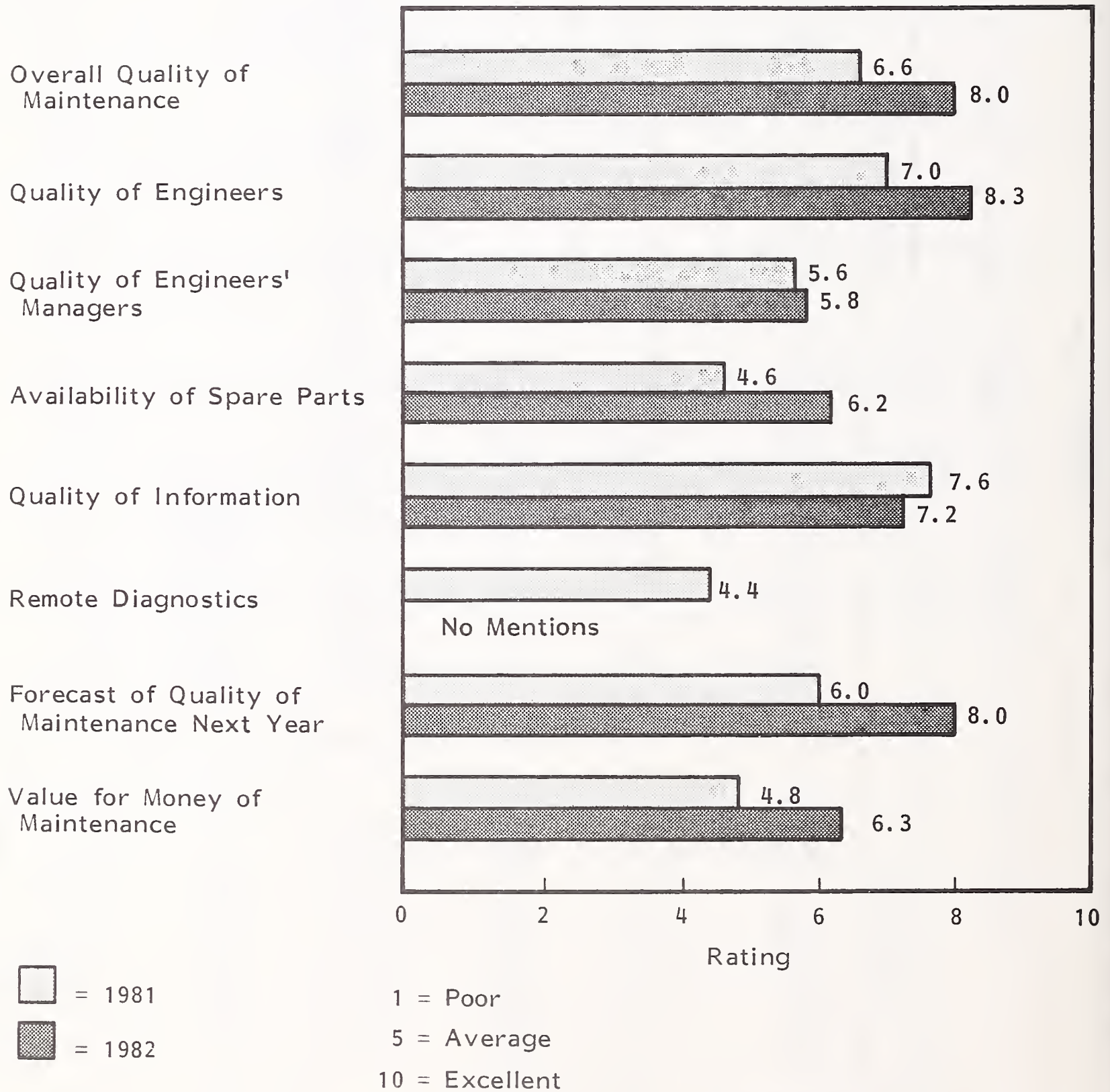
EXHIBIT B-6

USER SATISFACTION WITH MAINTENANCE OF
MEDIUM MAINFRAME SYSTEMS IN WEST GERMANY

Overall Quality of Maintenance — 5.2 / 7.3
Quality of Engineers — 5.6 / 7.3
Quality of Engineers' Managers — 6.4 / 6.7
Availability of Spare Parts — 5.4 / 6.2
Quality of Information — 6.2 / 6.6
Remote Diagnostics — 2.6 / 7.0
Forecast of Quality of Maintenance Next Year — 4.8 / 7.7
Value for Money of Maintenance — 4.2 / 6.6

Rating

☐ = 1981
▨ = 1982

1 = Poor
5 = Average
10 = Excellent

INPUT
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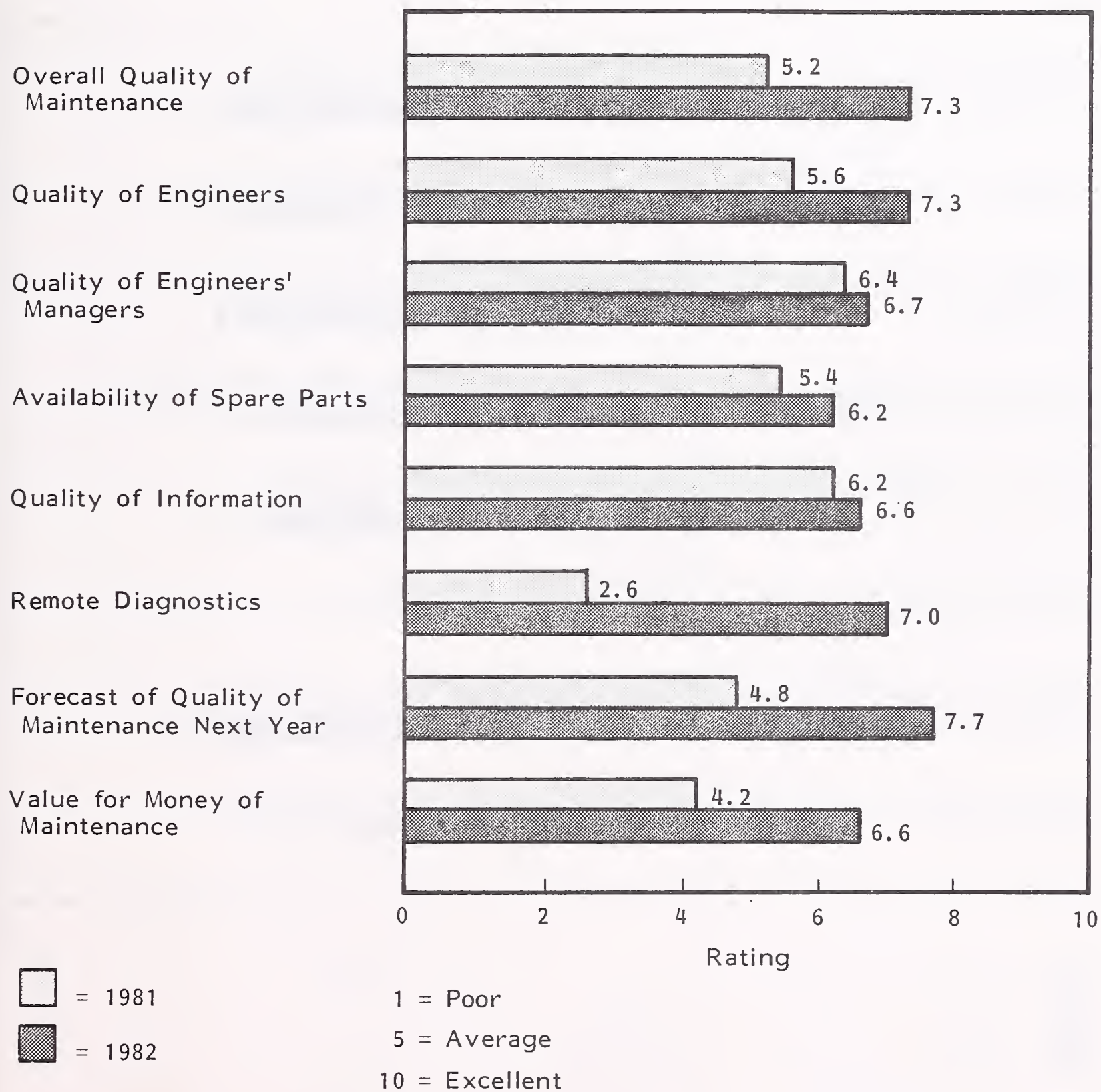
EXHIBIT B-7

USER SATISFACTION WITH MAINTENANCE OF
SMALL BUSINESS SYSTEMS IN WEST GERMANY

Overall Quality of Maintenance — 6.0 (1981), 6.5 (1982)
Quality of Engineers — 6.4 (1981), 6.2 (1982)
Quality of Engineers' Managers — 6.6 (1981), 6.5 (1982)
Availability of Spare Parts — 8.0 (1981), 6.3 (1982)
Quality of Information — 5.6 (1981), 6.0 (1982)
Remote Diagnostics — 5.0 (1981), No Mentions (1982)
Forecast of Quality of Maintenance Next Year — 7.0 (1981), 7.0 (1982)
Value for Money of Maintenance — 6.6 (1981), 5.0 (1982)

Rating

0   2   4   6   8   10

☐ = 1981
▨ = 1982

1 = Poor
5 = Average
10 = Excellent

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USER SATISFACTION WITH MAINTENANCE OF
OTHER MINICOMPUTERS IN WEST GERMANY

Overall Quality of Maintenance — 5.2 (1981), 6.0 (1982)
Quality of Engineers — 7.0 (1981), 6.6 (1982)
Quality of Engineers' Managers — 4.4 (1981), 5.0 (1982)
Availability of Spare Parts — 2.2 (1981), 7.0 (1982)
Quality of Information — 7.4 (1981), 5.5 (1982)
Remote Diagnostics — 4.6 (1981), No Mentions (1982)
Forecast of Quality of Maintenance Next Year — 6.4 (1981), 6.6 (1982)
Value for Money of Maintenance — 5.8 (1981), 5.0 (1982)

Rating

☐ = 1981
▦ = 1982

1 = Poor
5 = Average
10 = Excellent

INPUT
FAE2 P93

EXHIBIT B-9

USER SATISFACTION WITH MAINTENANCE OF
PERIPHERALS IN WEST GERMANY

	Rating
Overall Quality of Maintenance	6.2 (1981) / 7.7 (1982)
Quality of Engineers	5.6 (1981) / 7.8 (1982)
Quality of Engineers' Managers	6.6 (1981) / 6.5 (1982)
Availability of Spare Parts	2.8 (1981) / 6.4 (1982)
Quality of Information	6.0 (1981) / 6.5 (1982)
Remote Diagnostics	No Mentions (1981) / 7.6 (1982)
Forecast of Quality of Maintenance Next Year	6.0 (1981) / 7.6 (1982)
Value for Money of Maintenance	5.6 (1981) / 6.6 (1982)

Rating

☐ = 1981
▨ = 1982

1 = Poor
5 = Average
10 = Excellent

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EXHIBIT B-10

USER SATISFACTION WITH MAINTENANCE OF
TERMINALS IN WEST GERMANY

Overall Quality of Maintenance — 6.6 (1981), 6.8 (1982)
Quality of Engineers — 7.0 (1981), 7.2 (1982)
Quality of Engineers' Managers — 5.6 (1981), 5.5 (1982)
Availability of Spare Parts — 4.4 (1981), 5.8 (1982)
Quality of Information — 6.6 (1981), 5.4 (1982)
Remote Diagnostics — No Mention (1981), 7.5 (1982)
Forecast of Quality of Maintenance Next Year — 7.0 (1981), 7.6 (1982)
Value for Money of Maintenance — 5.2 (1981), 5.6 (1982)

Rating

☐ = 1981
▨ = 1982

1 = Poor
5 = Average
10 = Excellent

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EXHIBIT B-11

USER SATISFACTION WITH MAINTENANCE OF
WORD PROCESSORS IN WEST GERMANY

Category	1981	1982
Overall Quality of Maintenance	5.4	8.0
Quality of Engineers	6.6	8.0
Quality of Engineers' Managers	6.4	No Mentions
Availability of Spare Parts	4.6	6.0
Quality of Information	5.6	5.0
Remote Diagnostics	No Mentions	No Mentions
Forecast of Quality of Maintenance Next Year	7.0	8.0
Value for Money of Maintenance	5.2	6.0

Rating

□ = 1981
▨ = 1982

1 = Poor
5 = Average
10 = Excellent

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USER SATISFACTION WITH MAINTENANCE OF
SYSTEMS SOFTWARE IN WEST GERMANY

Overall Quality of Maintenance — 7.0 / 6.2

Quality of Engineers — 6.0 / 6.7

Quality of Engineers' Managers — 6.0 / 6.9

Availability of Spare Parts — Not Available

Quality of Information — 6.4 / 5.6

Remote Diagnostics — No Mentions / 3.6

Forecast of Quality of Maintenance Next Year — 7.0 / 7.7

Value for Money of Maintenance — 6.2 / 5.6

Rating

0   2   4   6   8   10

☐ = 1981
▨ = 1982

1 = Poor
5 = Average
10 = Excellent

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EXHIBIT B-13

USER SATISFACTION WITH MAINTENANCE OF
APPLICATIONS SOFTWARE IN WEST GERMANY

- 147 -
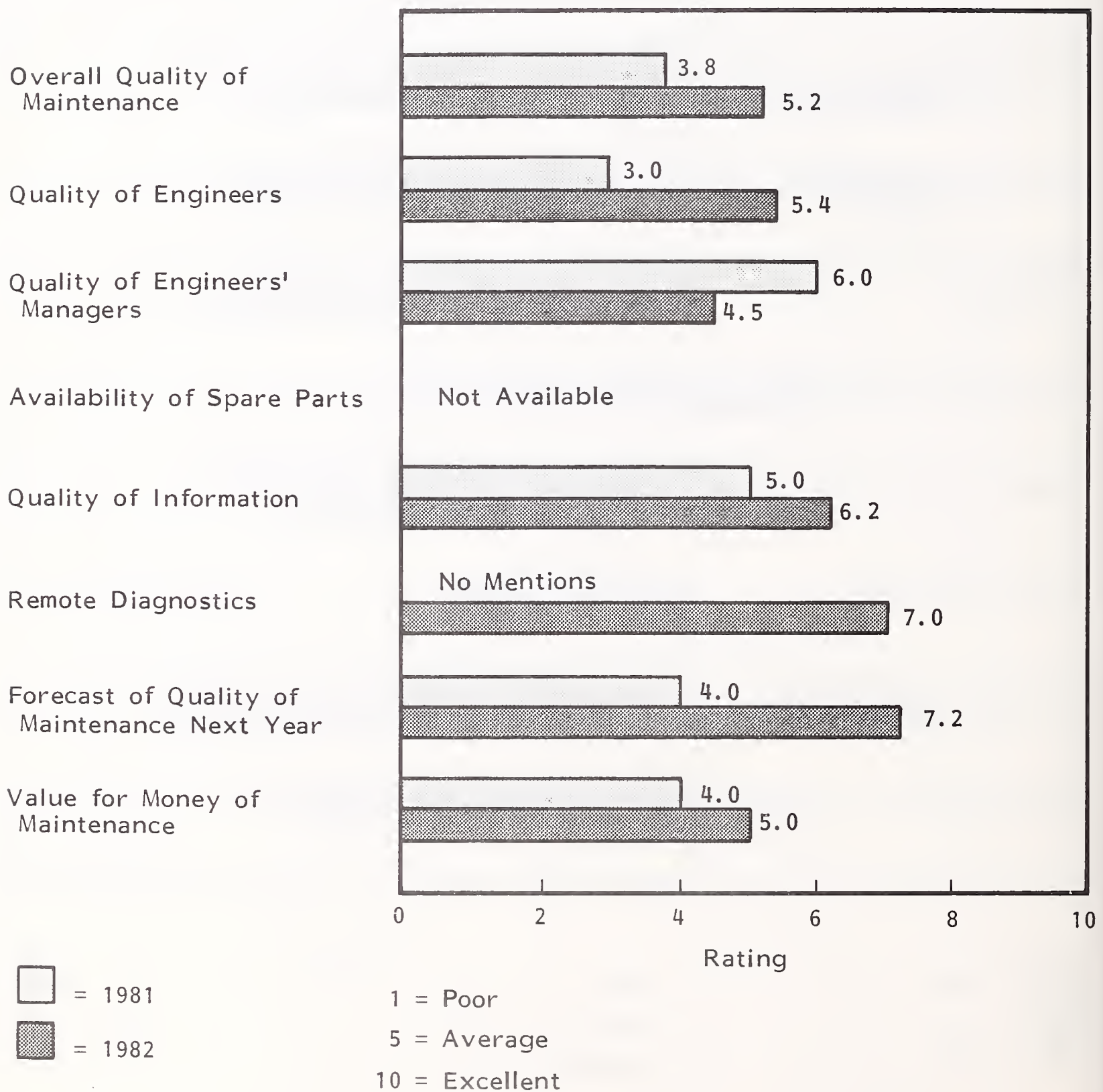
USERS' PERCEPTION OF SERVICEABILITY FOR LARGE MAINFRAME SYSTEMS
IN WEST GERMANY

| | TIME IN HOURS | | | |
| | 1981 | | 1982 | |
SERVICE	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0.50	2.50	0.50-1.0	1.0
Actual	0.50	4.75	1.0-1.0	1.0
Minimum Acceptable	0.50	3.50	1.0-2.0	1.0
Repair Time				
Preferred	0.50	2.50	1.0-2.0	1.50
Actual	0.50	5.0	1.0-1.0	1.0
Maximum Acceptable	0.50	4.50	1.0-1.0	1.0

INPUT
FAE2

USERS' PERCEPTION OF SERVICEABILITY FOR
MEDIUM MAINFRAME SYSTEMS IN WEST GERMANY

	TIME IN HOURS			
	1981		1982	
SERVICE	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0.50-4.0	0.50	0-2.0	0.50
Actual	0.50-5.0	1.50	0-6.0	2.0
Minimum Acceptable	0.75-4.50	1.75	1.0-8.0	1.0
Repair Time				
Preferred	0.50-4.50	1.0	0.50-5.0	1.0
Actual	0.50-5.0	2.50	1.0-4.0	1.0
Maximum Acceptable	0.50-5.0	3.25	1.0-8.0	2.0

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USERS' PERCEPTION OF SERVICEABILITY FOR SMALL BUSINESS SYSTEMS IN WEST GERMANY

| | TIME IN HOURS | | | |
| | 1981 | | 1982 | |
SERVICE	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0.50-3.0	1.0	0.50-3.0	1.0
Actual	0.50-5.0	1.50	1.75-6.0	2.0
Minimum Acceptable	0.50-4.75	1.75	1.0-8.0	2.0
Repair Time				
Preferred	0.50-3.0	1.0	1.0-3.0	1.0
Actual	1.0-5.0	1.75	0-1.0	1.0
Maximum Acceptable	1.0-4.50	2.0	1.50-8.0	2.0

USERS' PERCEPTION OF SERVICEABILITY FOR OTHER MINICOMPUTERS
IN WEST GERMANY

| SERVICE | TIME IN HOURS | | | |
| | 1981 | | 1982 | |
	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0.50-3.50	1.0	0-1.0	0.50
Actual	0.50-5.0	2.0	2.0-5.0	3.0
Minimum Acceptable	1.0-5.0	2.50	4.0	4.0
Repair Time				
Preferred	0.50-4.0	1.0	0	0
Actual	0.50-5.0	1.75	2.0-4.0	3.0
Maximum Acceptable	1.0-5.0	2.25	3.0	3.0

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USERS' PERCEPTION OF SERVICEABILITY FOR PERIPHERALS
IN WEST GERMANY

| | TIME IN HOURS | | | |
| | 1981 | | 1982 | |
SERVICE	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0.50-4.50	1.0	0-2.0	1.0
Actual	1.0-5.0	1.50	0-24.0	2.0
Minimum Acceptable	1.5	2.50	1.0-5.0	2.0
Repair Time				
Preferred	0.50-5.0	0.50	0-1.0	1.0
Actual	0.50-5.0	1.0	0.50-6.0	2.0
Maximum Acceptable	0.50-5.0	1.0	1.0-4.0	2.0

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EXHIBIT B-19

USERS' PERCEPTION OF SERVICEABILITY FOR TERMINALS
IN WEST GERMANY

| | TIME IN HOURS | | | |
| | 1981 | | 1982 | |
SERVICE	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0.50-5.0	0.50	0-4.0	1.0
Actual	0.50-5.0	1.0	0-24.0	2.0
Minimum Acceptable	0.50-5.0	1.0	1.0-48.0	2.0
Repair Time				
Preferred	0.50-5.0	1.0	0-4.0	1.0
Actual	0.50-5.0	1.50	0.50-48.0	2.0
Maximum Acceptable	0.50-5.0	2.0	1.0-5.0	1.0

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USERS' PERCEPTION OF SERVICEABILITY FOR WORD PROCESSORS
IN WEST GERMANY

| | TIME IN HOURS | | | |
| | 1981 | | 1982 | |
SERVICE	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0.50-5.0	1.50	1.0	1.0
Actual	0.50-5.0	3.0	3.0	3.0
Minimum Acceptable	1.0-4.50	2.75	1.0	1.0
Repair Time				
Preferred	0.50-4.0	0.50	1.0	1.0
Actual	0.50-5.0	2.25	4.0	4.0
Maximum Acceptable	1.0-4.0	3.0	1.0	1.0

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USERS' PERCEPTION OF SERVICEABILITY FOR SYSTEMS SOFTWARE
IN WEST GERMANY

	TIME IN HOURS			
	1981		1982	
SERVICE	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0.50-5.0	6.0	0-8.0	1.0
Actual	0.75-5.0	8.0	1.0-12.0	4.0
Minimum Acceptable	1.0-5.0	9.0	1.0-24.0	4.0
Repair Time				
Preferred	0.50-5.0	2.0	0-24.0	2.0
Actual	0.50-5.0	6.0	1.0-10.0	2.0
Maximum Acceptable	0.50-5.0	7.0	1.0-24.0	2.0

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WEST GERMAN RESPONDENTS' VIEWS OF SYSTEM AVAILABILITY

SYSTEM AVAILABILITY (percent) CLASSIFICATION	CURRENTLY GETTING		IDEALLY WOULD LIKE		MINIMUM WOULD ACCEPT	
	1981	1982	1981	1982	1981	1982
Large Mainframe Systems	96.2%	96.7%	99.2%	96.8%	95.4%	96.1%
Medium Mainframe Systems	98.1	92.2	99.6	98.1	96.2	91.6
Small Business Systems	95.6	91.7	98.2	95.9	95.0	92.5
Other Minicomputers	94.1	90.0	99.1	99.0	95.1	92.5
Peripherals	97.8	92.0	99.2	97.4	96.1	90.6
Terminals	96.4	92.9	98.8	97.9	94.5	89.1
Word Processors	93.8	90.0	98.1	95.0	96.3	95.0
Systems Software	96.8	97.0	99.2	99.5	97.2	97.1
Applications Software	94.4	94.5	98.8	96.0	96.3	93.9

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RESPONDENTS' PRICE INCREASES AND
FORECASTS IN WEST GERMANY

CLASSIFICATION	PERCENT INCREASE IN LAST 12 MONTHS		FORECAST INCREASE EXPECTED IN NEXT 12 MONTHS		PERCENT INCREASE THAT WOULD BE UNACCEPTABLE	
	1981	1982	1981	1982	1981	1982
Large Mainframe Systems	5.4%	3.4%	4.2%	4.4%	6.4%	9.3%
Medium Mainframe Systems	5.1	6.0	5.2	5.0	7.8	7.6
Small Business Systems	6.9	7.3	4.8	4.7	10.2	9.0
Other Minicomputers	7.2	No Mention	7.0	No Mention	11.3	No Mention
Peripherals	5.2	6.5	5.2	4.6	7.0	9.1
Terminals	6.8	5.9	5.1	3.4	9.8	7.8
Word Processors	4.8	No Mention	5.0	No Mention	6.5	No Mention
Systems Software	5.3	8.5	4.8	6.0	8.1	6.0
Applications Software	7.1	No Mention	5.4	No Mention	7.0	No Mention

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EXHIBIT B-24

RESPONDENTS' AVERAGE CONTRACTED MAINTENANCE PERIOD VERSUS ACTUAL EQUIPMENT USAGE, 1981 AND 1982, IN WEST GERMANY

MAINTENANCE PERIOD AND EQUIPMENT USAGE	LARGE MAINFRAME SYSTEMS		MEDIUM MAINFRAME SYSTEMS		SMALL BUSINESS SYSTEMS		OTHER MINICOMPUTERS		PERIPHERALS		TERMINALS		WORD PROCESSORS	
	1981	1982	1981	1982	1981	1982	1981	1982	1981	1982	1981	1982	1981	1982
Contracted Maintenance (Number of Shifts)	2.3	1.5	1.4	1.4	1.1	1.1	1.2		1.4	1.5	1.3	1.1	1.1	1.0
Equipment Usage (Number of Shifts)	2.7	2.5	2.1	1.7	1.4	1.1	1.8	N	2.2	2.1	1.6	1.4	1.3	1.0
Contracted Maintenance Forecast Next Year (Number of Shifts)	2.3	1.5	1.7	1.3	1.3	1.4	1.3	O	1.6	1.5	1.3	1.1	1.1	1.0
Forecast Equipment Usage Next Year (Number of Shifts)	2.9	2.5	2.7	1.7	1.6	1.3	1.8	M	2.2	2.1	1.8	1.7	1.5	1.0
Contracted Number of Days per Week	5.2	5.3	5.1	4.7	5.0	5.1	5.2	E	5.1	5.1	5.3	5.0	5.0	5.0
Actual Usage, (Days per Week)	6.1	5.8	6.2	5.1	5.7	5.1	5.4	N	5.7	5.4	5.6	5.5	5.0	5.0
Contracted Number of Days per Week Next Year	5.2	5.3	5.1	4.6	5.2	5.1	5.3	T	5.2	5.1	5.3	5.0	5.6	5.0
Forecast Usage (Days per Week) Next Year	6.2	5.8	6.6	5.1	6.1	5.1	5.8	IONS	5.8	5.4	5.8	5.5	5.6	5.0

(OTHER MINICOMPUTERS 1982 column reads vertically: "NO MENTIONS")

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EXHIBIT B-25

USERS' RATING OF IMPORTANCE OF
MAINTENANCE ISSUES IN WEST GERMANY

MAINTENANCE ISSUES	ASKED IN 1981		ASKED IN 1982	
	1981	1983	1982	1984
System Availability	9.2	9.9	9.8	9.9
Response Time	9.6	9.6	8.7	8.9
Repair Time	9.2	8.9	8.3	8.4
Preventive Maintenance	6.6	6.6	6.7	6.8
Remote Maintenance	5.9	7.6	4.6	5.5
Escalation Procedures	6.6	5.9	5.6	5.8
Price of Maintenance	5.6	7.3	7.7	8.1
Stable Engineer Population	6.6	6.9	6.4	6.4
Uptime Guarantees	6.6	8.9	7.2	7.4
Equipment Reliability	9.2	9.6	9.7	9.7
Support Centres	6.6	7.6	7.6	8.0
Software Maintenance	5.9	6.6	8.9	9.2
Flexible Contract	5.6	5.9	5.7	5.7
User Self-Maintenance	3.6	4.3	2.4	2.7

1 = Unimportant
5 = Average
10 = Important

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APPENDIX C: FRENCH USER DATABASE

APPENDIX C: FRENCH USER DATABASE

A.   COMPARISON: 1982 VERSUS 1981

- INPUT's assessment of French users indicates a dynamic marketplace for maintenance issues now and in the future.

- Cii Honeywell Bull and IBM continued to dominate the market for maintenance in large and medium systems, as shown in Exhibit C-1.

    - Market shares are as seen by respondent users and provide a general view of the market.

    - The purpose of this report is to discuss and analyse maintenance issues, trends, and data. Market share information is not intended to provide accurate analyses but a general users' view.

- Significant changes occurring between 1981 and 1982 include the following:

    - While French users are expecting a modest price increase, from 8.3% in 1982 to 9.6% in 1983, the acceptable/unacceptable threshold has barely changed - up 0.5% as shown by Exhibit C-2.

    - Contracted maintenance shift coverage is expected to shrink significantly by 32% next year, from 1.6 shifts to 1.1 shifts, on average.

INPUT

EXHIBIT C-1

RESPONDENTS' VIEW OF LARGE AND MEDIUM
MAINFRAME VENDORS IN FRANCE

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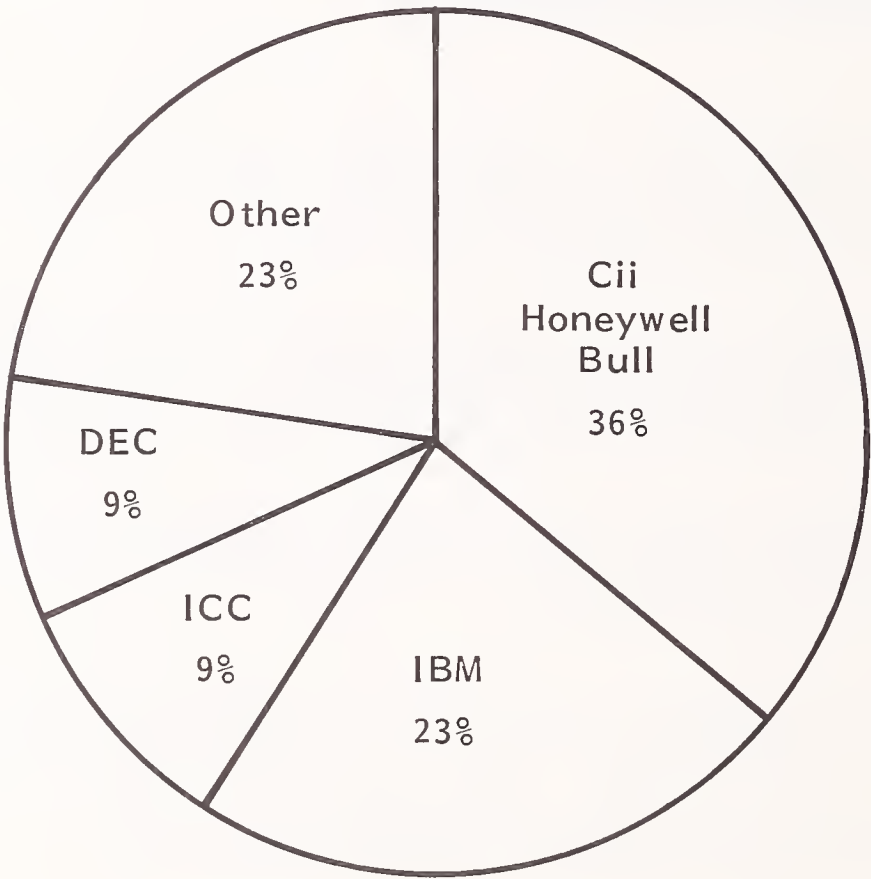
EXHIBIT C-2

USERS' SENSITIVITY REGARDING MAINTENANCE PRICE INCREASES IN FRANCE

LEVEL OF INCREASE	1981	1982
Actual Increases As Perceived By Users (Last 12 Months)	9.6%	9.8%
Expected Increases (Next 12 Months)	8.3	9.6
Unacceptable Level Of Increase	12.0	12.5

INPUT
FAE2 P108

- Fifty-nine percent of user satisfaction parameters improved across all product categories.

    - Eighty-eight percent of the user satisfaction parameters improved in the small systems segment.

    - Three quarters of the user satisfaction parameters improved in the large systems and terminal categories.

    - Seventy-one percent of user satisfaction parameters improved for systems and applications software segments.

    - Peripherals had only one parameter improvement out of eight for a 12.5% gain.

- Serviceability and response and repair times showed an improvement in actual response times for 50% of the product/software classifications, offset by a degradation in repair times (medians) for three quarters of product/software classes.

- Fifty-four percent of maintenance issues decreased in value of importance. Among these were:

    - Preventive maintenance, down 33% in value.

    - Maintenance pricing, down 19% in value of importance.

    - Repair time degraded in 17% of the cases.

- On the positive side:

    - Repair time increased in importance by 17%.

INP

- Escalation procedures were expressed by users as being 14% more important this year than last.

- Support centres increased in importance by 10%.

B. GENERAL APPRAISAL OF THE FRENCH MAINTENANCE MARKET

- The general quality of service in France is improving, as shown in Exhibit C-3.

- Feedback from users to direct questioning about key issues is summarised in Exhibit C-4.

  - One particular quotation from a user is noteworthy: 'Monopoly of the manufacturer lends itself to abusive costs'.

- Exhibits C-5 through C-21 graphically indicate users' satisfaction with parameters of service.

- Serviceability and response and repair times, are illustrated in Exhibits C-22 through C-29.

- System availability, pricing, contract/usage, and maintenance issues are summarised in Exhibits C-30, C-31, C-32, and C-33, respectively.

INPUT

EXHIBIT C-3

SIGNIFICANT CHANGES IN USERS' OPINIONS OF SERVICE QUALITY,

FRANCE - 1982 VERSUS 1981

SERVICE CATEGORY	PRODUCT CATEGORY	CHANGE	CONCLUSIONS
Overall Quality of Maintenance	Large and Small Systems, Terminals, and Applications Software	+1.2 to +2.4	Strong indications of genuine improvement in service.
Quality of Engineer	Small Systems, Terminals, Word Processors, Applications Software	+1.0 to +2.8	Image of the field engineer has been greatly improved and probably is the main reason for increase in overall quality.
Quality of Engineers' Management	Small Systems Terminals, Word Processors (positive), Other Minis, and Applicable Software (negative)	-0.8 to +1.9	More favorable improvements than not.
Availability of Spares	Small Systems, Other Minis, Terminals (positive), Medium Systems, and Word Processors (negative)	-0.8 to +2.3	Half the job of getting spares to the site is done.
Quality of Information	Small Systems and Systems Software	+1.0 to +2.3	Reflects better management in service.
Remote Diagnostics	Large Systems (positive) Other Minis (negative)	-2.7 to +2.0	There is still some apprehension, but growing acceptance.
Forecast of the Quality of Maintenance	Large Systems (negative), Small Systems, Other Minis, Terminals, and Applications Software	-0.8 to +2.6	Optimism is the key.
Value of Maintenance	Peripherals (negative) and Small Systems and Applications Software (positive)	-0.7 to +1.7	Values are to increase in specialized areas.

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FAE2

EXHIBIT C-4

USER CONSENSUS REGARDING KEY SERVICE ISSUES FOR FRANCE

CONCERN	USER REPLY
Guidelines for Evaluating Cost of Maintenance	'Number of repairs', 'equipment reliability', 'price related to uptime', 'varies according to MTBF', 'as provided by IBM', 'percent of purchase price', 'probability of breakdown'.
Attitude Towards Preventive Maintenance	73% accept PM. 27% find it a burden.
Users Receiving Maintenance Price Discount	25% of French users get some sort of maintenance discount.
Attitude Towards Remote Diagnostics	65% of French users favor remote diagnostics. 29% are negatively inclined. 6% don't know.
Considering Third-Party Maintenance	31% are either considering third-party maintenance or using it. 63% are not interested. 6% don't know about third-party maintenance.
Annoyances Regarding Maintenance	'Delays and incompetence of newly trained staff', 'high cost', 'response time too long', 'poor standard of work by average technician', 'cost of contract', 'response time', 'waiting for parts that are not in good condition', 'reduction of technician quality', 'monopoly of the manufacturer lends itself to abusive costs'.

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INPUT
FAE2P110

EXHIBIT C-5

USER SATISFACTION WITH MAINTENANCE OF LARGE MAINFRAME SYSTEMS IN FRANCE

Category	1981	1982
Overall Quality of Maintenance	6.2	7.4
Quality of Engineers	7.4	7.8
Quality of Engineers' Managers	6.8	7.0
Availability of Spare Parts	6.0	6.2
Quality of Information	5.6	6.2
Remote Diagnostics	5.0	7.0
Forecast of Quality of Maintenance Next Year	6.8	6.0
Value for Money of Maintenance	6.2	6.2

Rating

☐ = 1981

▨ = 1982

1 = Poor

5 = Average

10 = Excellent

INPUT
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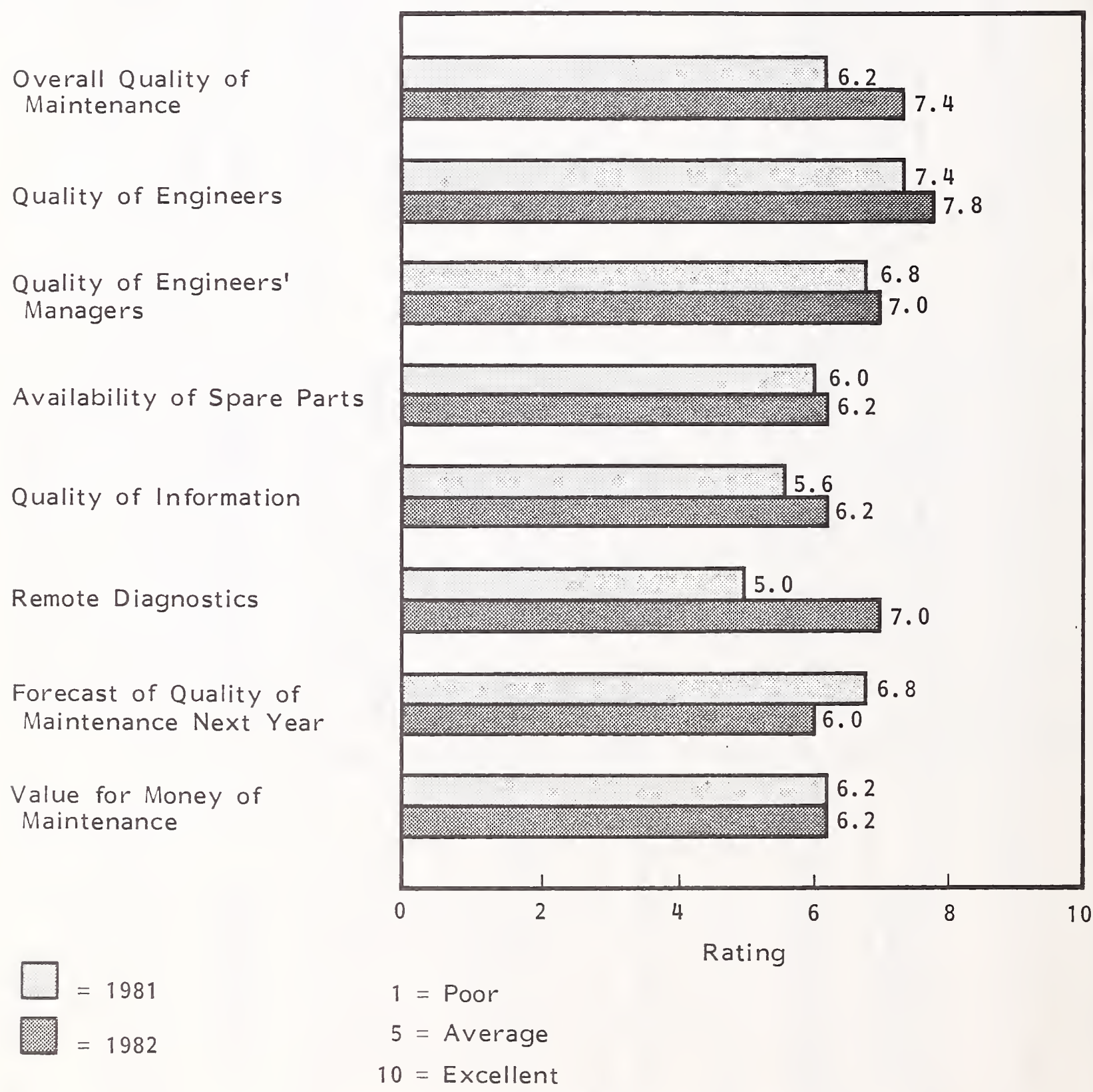
EXHIBIT C-6

USER SATISFACTION WITH MAINTENANCE OF MEDIUM MAINFRAME SYSTEMS IN FRANCE

	Rating
Overall Quality of Maintenance	6.6 / 6.8
Quality of Engineers	7.2 / 7.1
Quality of Engineers' Managers	6.2 / 5.7
Availability of Spare Parts	5.6 / 4.8
Quality of Information	5.4 / 5.7
Remote Diagnostics	5.4 / No Mentions
Forecast of Quality of Maintenance Next Year	7.0 / 7.3
Value for Money of Maintenance	6.4 / 5.9

= 1981

= 1982

1 = Poor

5 = Average

10 = Excellent

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INPUT
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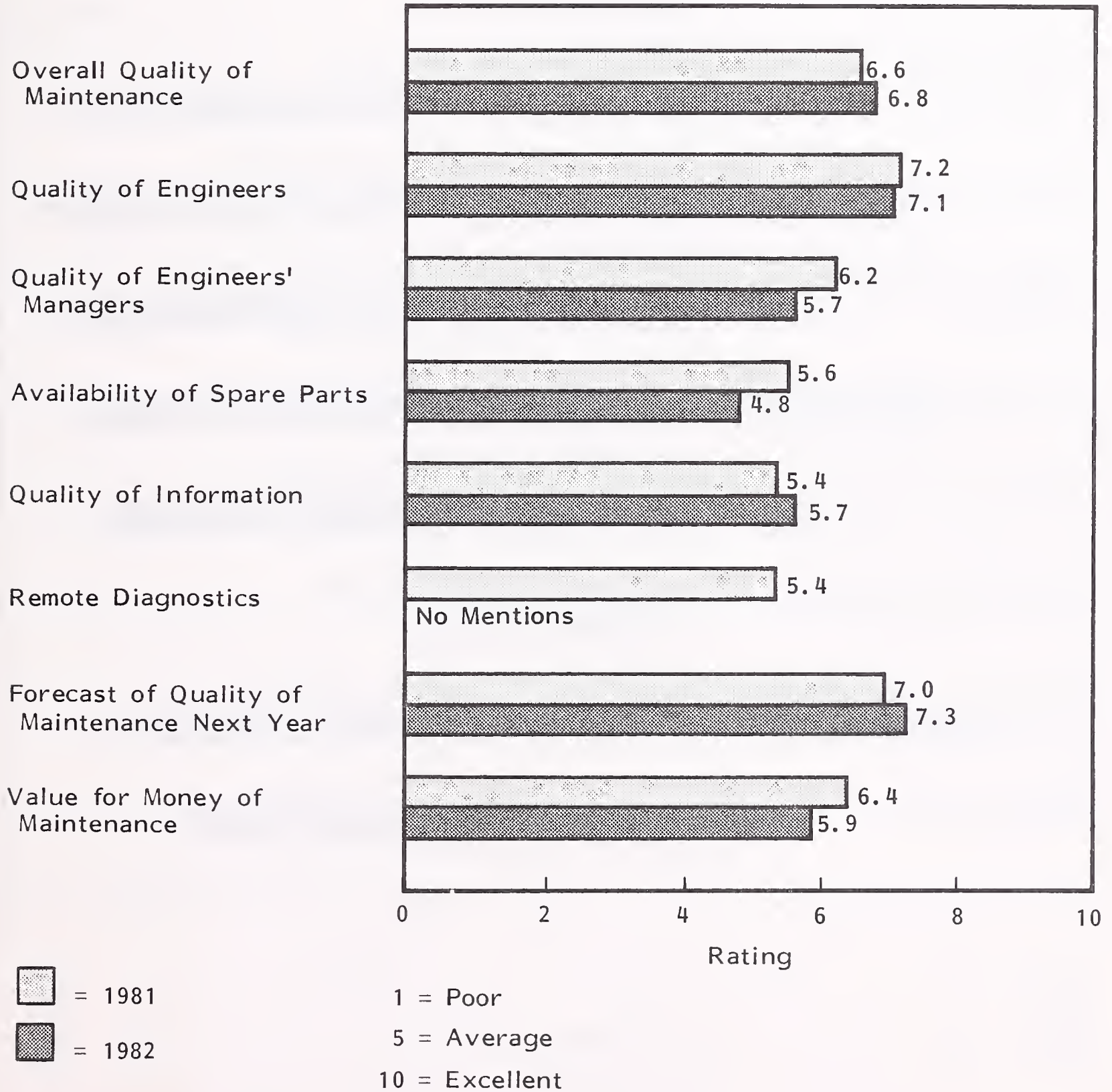
EXHIBIT C-7

USER SATISFACTION WITH MAINTENANCE OF SMALL BUSINESS SYSTEMS IN FRANCE

Category	1981	1982
Overall Quality of Maintenance	5.8	8.7
Quality of Engineers	6.4	9.0
Quality of Engineers' Managers	6.8	8.7
Availability of Spare Parts	5.4	8.7
Quality of Information	6.0	8.3
Remote Diagnostics	5.0	No Mentions
Forecast of Quality of Maintenance Next Year	6.0	8.0
Value for Money of Maintenance	5.6	7.3

Rating

☐ = 1981
▨ = 1982

1 = Poor
5 = Average
10 = Excellent

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FAE2

EXHIBIT C-8

USER SATISFACTION WITH MAINTENANCE OF OTHER MINICOMPUTERS IN FRANCE

	1981	1982
Overall Quality of Maintenance	6.6	6.6
Quality of Engineers	7.2	7.4
Quality of Engineers' Managers	6.6	5.8
Availability of Spare Parts	5.2	7.4
Quality of Information	5.6	5.9
Remote Diagnostics	6.2	3.5
Forecast of Quality of Maintenance Next Year	6.6	8.0
Value for Money of Maintenance	6.0	5.5

Rating

☐ = 1981

▨ = 1982

1 = Poor

5 = Average

10 = Excellent

INPUT
FAE2

EXHIBIT C-9

USER SATISFACTION WITH MAINTENANCE OF PERIPHERALS
IN FRANCE

	Rating
Overall Quality of Maintenance	6.6 / 6.6
Quality of Engineers	7.6 / 7.0
Quality of Engineers' Managers	5.8 / 5.8
Availability of Spare Parts	6.0 / 5.6
Quality of Information	6.0 / 5.7
Remote Diagnostics	6.4 / No Mentions
Forecast of Quality of Maintenance Next Year	7.2 / 7.6
Value for Money of Maintenance	6.2 / 5.5

Rating: 0 2 4 6 8 10

□ = 1981
▨ = 1982

1 = Poor
5 = Average
10 = Excellent

INP
FAE2

EXHIBIT C-10

USER SATISFACTION WITH MAINTENANCE OF TERMINALS
IN FRANCE

	Rating
Overall Quality of Maintenance	5.6 / 6.8
Quality of Engineers	6.2 / 7.2
Quality of Engineers' Managers	5.4 / 6.1
Availability of Spare Parts	5.6 / 7.4
Quality of Information	5.4 / 5.6
Remote Diagnostics	6.0 / No Mentions
Forecast of Quality of Maintenance Next Year	6.2 / 7.4
Value for Money of Maintenance	6.0 / 5.9

☐ = 1981
▨ = 1982

1 = Poor
5 = Average
10 = Excellent

INPUT
FAE2

EXHIBIT C-11

USER SATISFACTION WITH MAINTENANCE OF WORD PROCESSORS
IN FRANCE

Overall Quality of Maintenance — 6.4 / 7.0

Quality of Engineers — 6.0 / 7.0

Quality of Engineers' Managers — 6.2 / 7.0

Availability of Spare Parts — 7.2 / 7.0

Quality of Information — 6.6 / 6.0

Remote Diagnostics — No Mentions

Forecast of Quality of Maintenance Next Year — 6.6 / 7.0

Value for Money of Maintenance — 6.4 / 5.0

Rating

☐ = 1981
▨ = 1982

1 = Poor
5 = Average
10 = Excellent

- 172 -

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FAE2

EXHIBIT C-12

USER SATISFACTION WITH MAINTENANCE OF SYSTEMS SOFTWARE IN FRANCE

Overall Quality of Maintenance — 5.8 / 6.3

Quality of Engineers — 5.8 / 6.2

Quality of Engineers' Managers — 5.4 / 5.6

Availability of Spare Parts — Not Applicable

Quality of Information — 6.4 / 6.0

Remote Diagnostics — No Mentions / 5.7

Forecast of Quality of Maintenance Next Year — 7.0 / 7.5

Value for Money of Maintenance — 5.6 / 5.6

Rating

☐ = 1981
▨ = 1982

1 = Poor
5 = Average
10 = Excellent

INPUT
FAE2

EXHIBIT C-13

USER SATISFACTION WITH MAINTENANCE OF APPLICATIONS SOFTWARE IN FRANCE

	1981	1982
Overall Quality of Maintenance	4.4	6.8
Quality of Engineers	4.0	6.8
Quality of Engineers' Managers	5.6	4.8
Availability of Spare Parts	Not Applicable	
Quality of Information	6.0	7.0
Remote Diagnostics	No Mentions	5.5
Forecast of Quality of Maintenance Next Year	4.4	7.0
Value for Money of Maintenance	4.8	6.0

Rating

☐ = 1981

▨ = 1982

1 = Poor

5 = Average

10 = Excellent

INPUT
FAE2

EXHIBIT C-14

USERS' RATING OF OVERALL QUALITY OF
MAINTENANCE IN FRANCE

Large Mainframe Systems — 6.2 / 7.4

Medium Mainframe Systems — 6.6 / 6.8

Small Business Systems — 5.8 / 8.7

Other Minicomputers — 6.6 / 6.6

Peripherals — 6.6 / 6.6

Terminals — 5.6 / 6.8

Word Processors — 6.4 / 7.0

Systems Software — 5.8 / 6.3

Applications Software — 4.4 / 6.8

Rating (0, 2, 4, 6, 8, 10)

□ = 1981

▒ = 1982

1 = Poor/Low
5 = Average
10 = Excellent/High

INPUT
FAE2 P111

EXHIBIT C-15

USERS' RATING OF QUALITY OF ENGINEERS IN FRANCE

Large Mainframe Systems — 7.4 (1981), 7.8 (1982)
Medium Mainframe Systems — 7.2 (1981), 7.1 (1982)
Small Business Systems — 6.4 (1981), 9.0 (1982)
Other Minicomputers — 7.2 (1981), 7.4 (1982)
Peripherals — 7.6 (1981), 7.0 (1982)
Terminals — 6.2 (1981), 7.2 (1982)
Word Processors — 6.0 (1981), 7.0 (1982)
Systems Software — 5.8 (1981), 6.2 (1982)
Applications Software — 4.0 (1981), 6.8 (1982)

Rating

☐ = 1981
▨ = 1982

1 = Poor/Low
5 = Average
10 = Excellent/High

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EXHIBIT C-16

USERS' RATING OF QUALITY OF ENGINEERS' MANAGERS IN FRANCE

Large Mainframe Systems — 6.8 / 7.0

Medium Mainframe Systems — 6.2 / 5.7

Small Business Systems — 6.8 / 8.7

Other Minicomputers — 6.6 / 5.8

Peripherals — 5.8 / 5.8

Terminals — 5.4 / 6.1

Word Processors — 6.2 / 7.0

Systems Software — 5.4 / 5.6

Applications Software — 5.6 / 4.8

Rating

☐ = 1981

▨ = 1982

1 = Poor/Low

5 = Average

10 = Excellent/High

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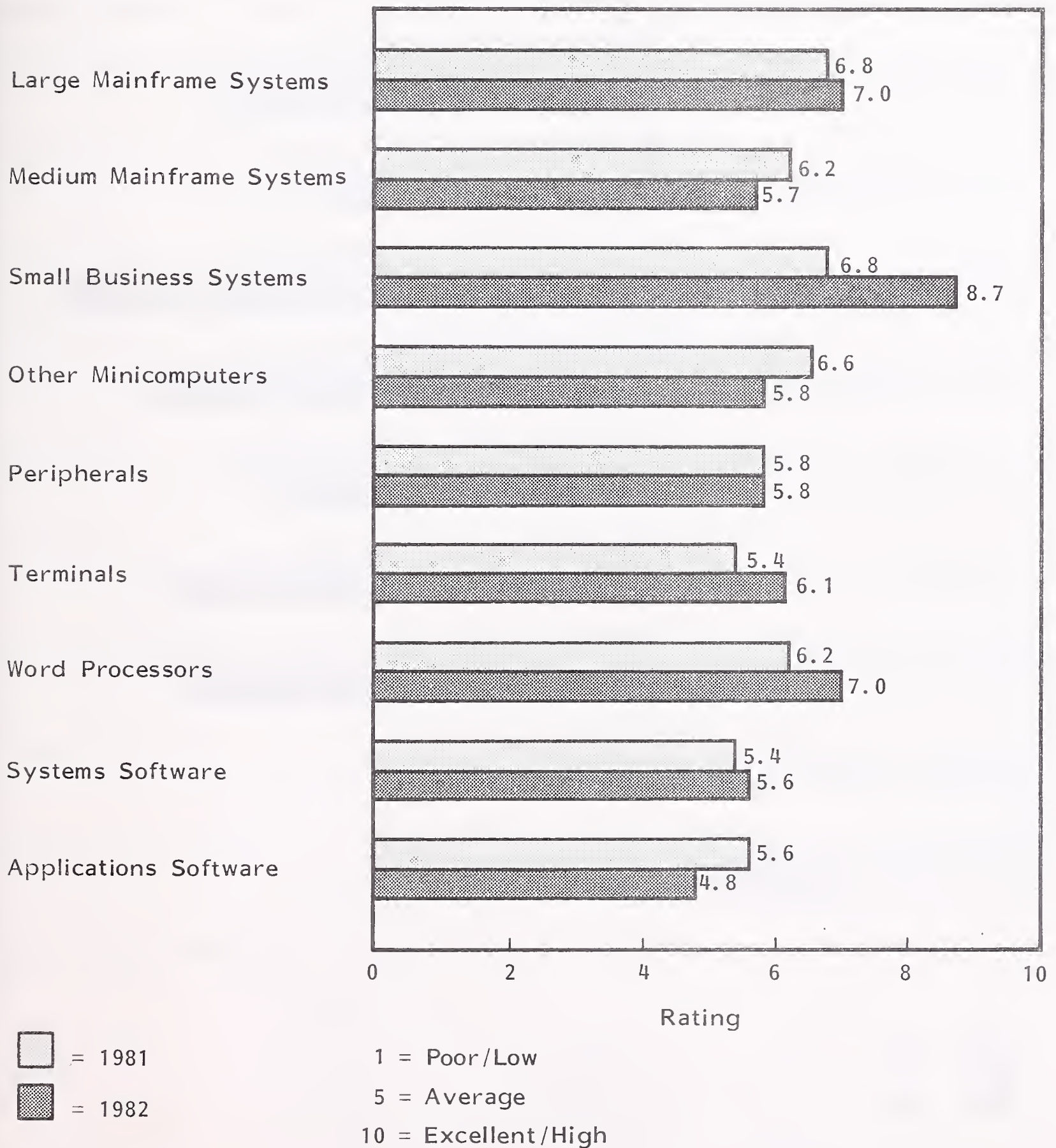
EXHIBIT C-17

USERS' RATING OF AVAILABILITY OF SPARE PARTS IN FRANCE

Large Mainframe Systems — 6.0 (1981), 6.2 (1982)
Medium Mainframe Systems — 5.6 (1981), 4.8 (1982)
Small Business Systems — 5.4 (1981), 8.7 (1982)
Other Minicomputers — 5.2 (1981), 7.4 (1982)
Peripherals — 6.0 (1981), 5.6 (1982)
Terminals — 5.6 (1981), 7.4 (1982)
Word Processors — 7.2 (1981), 7.0 (1982)
Systems Software — Not Applicable
Applications Software — Not Applicable

Rating (0 to 10)

☐ = 1981
▨ = 1982

1 = Poor/Low
5 = Average
10 = Excellent/High

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EXHIBIT C-18

USERS' RATING OF QUALITY OF INFORMATION IN FRANCE

Large Mainframe Systems — 5.6 / 6.2

Medium Mainframe Systems — 5.4 / 5.7

Small Business Systems — 6.0 / 8.3

Other Minicomputers — 5.6 / 5.9

Peripherals — 6.0 / 5.7

Terminals — 5.4 / 5.6

Word Processors — 6.6 / 6.0

Systems Software — 6.4 / 6.0

Applications Software — 6.0 / 7.0

Rating

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= 1981

= 1982

1 = Poor/Low

5 = Average

10 = Excellent/High

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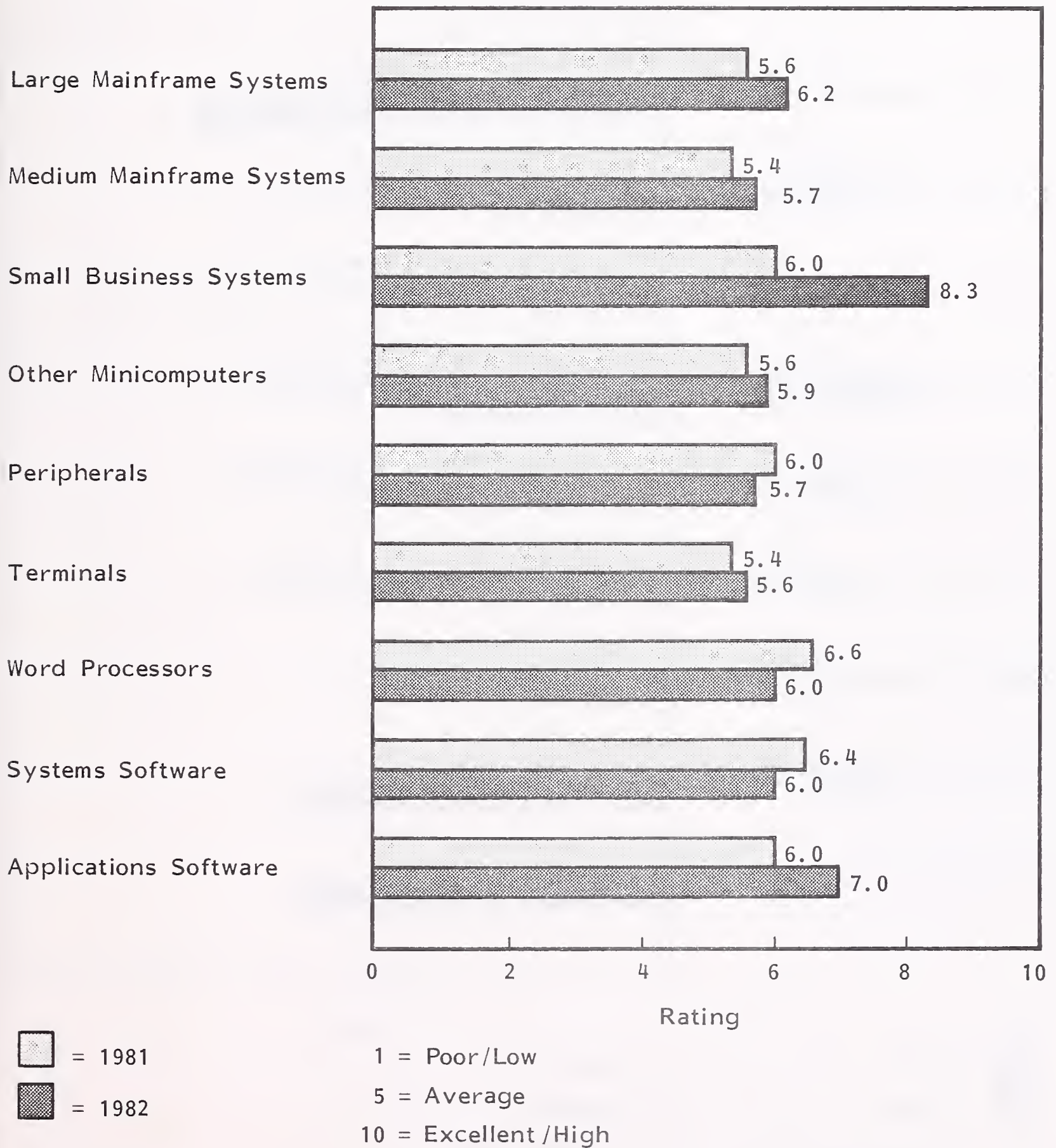
EXHIBIT C-19

USERS' RATING OF REMOTE DIAGNOSTICS IN FRANCE

Category	1981	1982
Large Mainframe Systems	5.0	7.0
Medium Mainframe Systems	5.4	No Data
Small Business Systems	5.0	No Data
Other Minicomputers	6.2	3.5
Peripherals	6.4	No Data
Terminals	6.0	No Data
Word Processors	No Data	No Data
Systems Software	No Data	5.7
Applications Software	No Data	5.5

Rating (horizontal axis: 0, 2, 4, 6, 8, 10)

□ = 1981
▨ = 1982

1 = Poor/Low
5 = Average
10 = Excellent/High

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FAE2F

EXHIBIT C-20

USERS' RATING OF QUALITY OF MAINTENANCE
IN FRANCE

Category	1981	1982
Large Mainframe Systems	6.8	6.0
Medium Mainframe Systems	7.0	7.3
Small Business Systems	6.0	8.0
Other Minicomputers	6.6	8.0
Peripherals	7.2	7.6
Terminals	6.2	7.4
Word Processors	6.6	7.0
Systems Software	7.0	7.5
Applications Software	4.4	6.0

Rating

☐ = 1981

▓ = 1982

1 = Poor/Low

5 = Average

10 = Excellent/High

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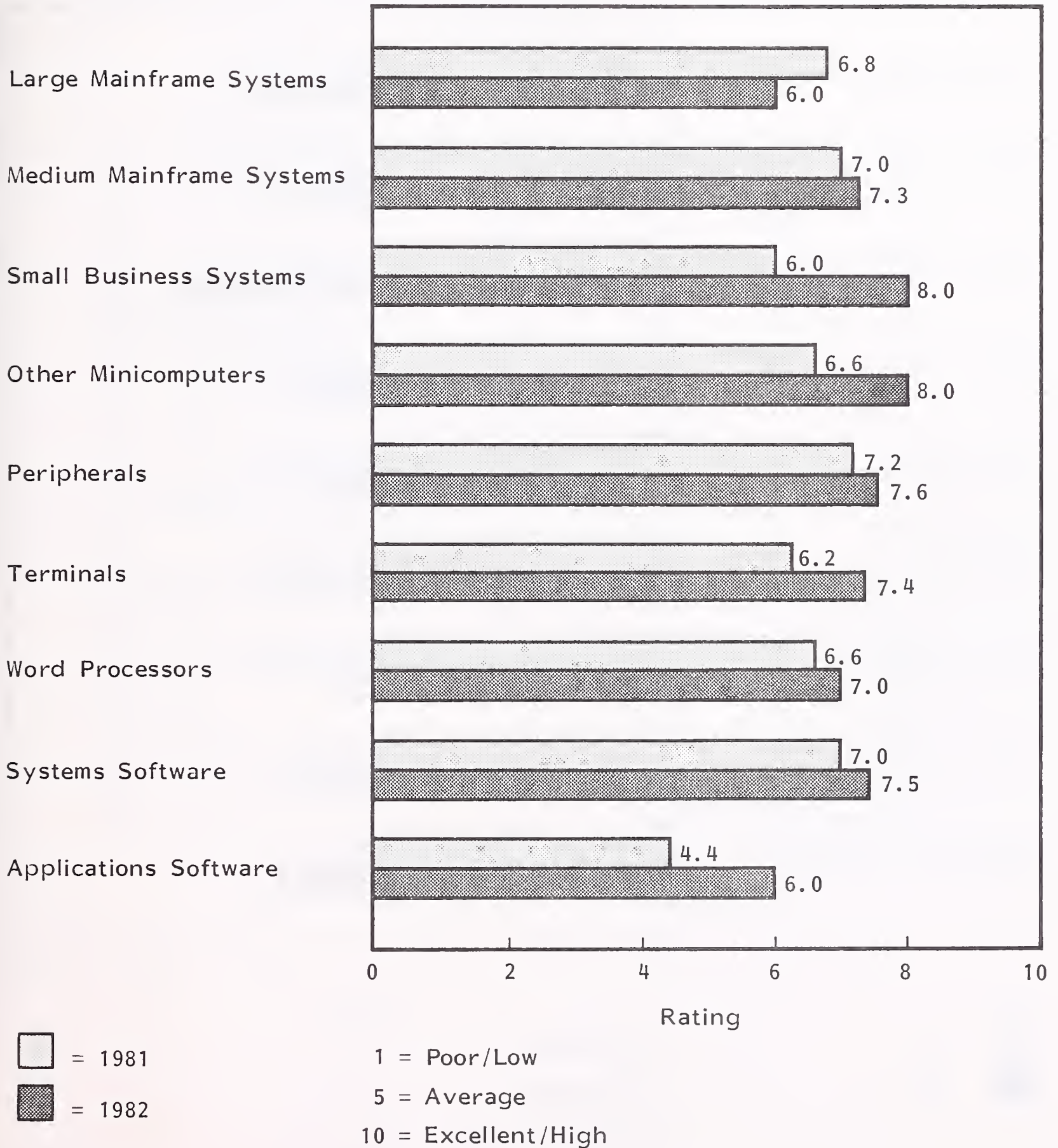
EXHIBIT C-21

USERS' RATING OF VALUE FOR MONEY OF
MAINTENANCE IN FRANCE

Category	1981	1982
Large Mainframe Systems	6.2	6.2
Medium Mainframe Systems	6.4	5.9
Small Business Systems	5.6	7.3
Other Minicomputers	6.0	5.5
Peripherals	6.2	5.5
Terminals	6.0	5.9
Word Processors	6.4	5.0
Systems Software	5.6	5.6
Applications Software	4.8	6.0

Rating

☐ = 1981

▨ = 1982

1 = Poor/Low

5 = Average

10 = Excellent/High

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FAE2P1

EXHIBIT C-22

- 183 -
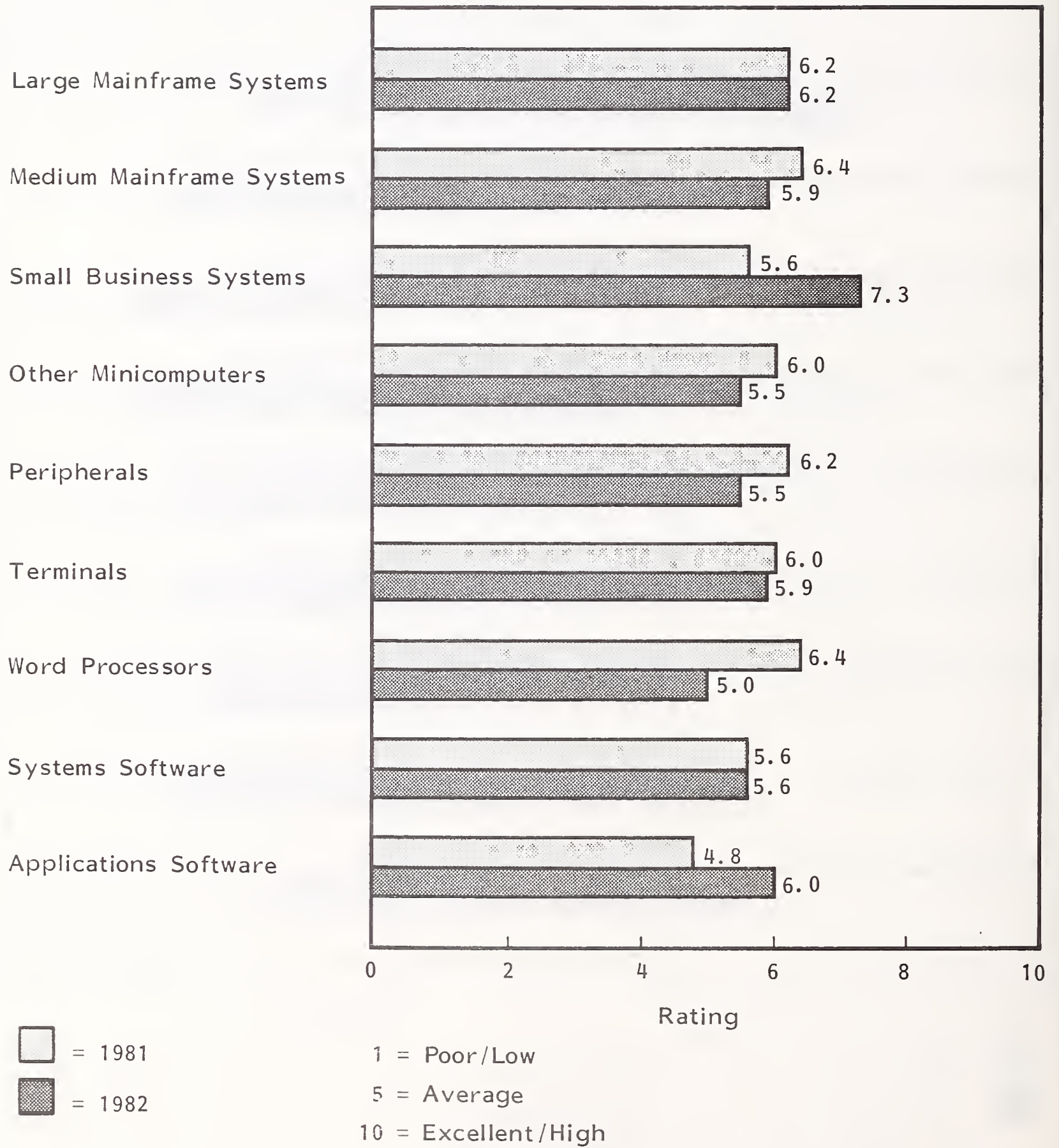
USERS' PERCEPTION OF SERVICEABILITY FOR LARGE SYSTEMS
IN FRANCE

	TIME IN HOURS			
	1981		1982	
SERVICE	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0.50-4.0	0.75	1.0-2.0	1.0
Actual	0.25-5.0	2.0	1.0-6.0	3.0
Minimum Acceptable	0.50-5.0	1.50	2.0-3.0	2.0
Repair Time				
Preferred	0.50-4.50	0.75	0.5-2.0	1.0
Actual	0.50-5.0	1.0	1.0-24.0	2.0
Maximum Acceptable	1.0-5.0	2.0	2.0	2.0

INPUT
FAE2

EXHIBIT C-23

USERS' PERCEPTION OF SERVICEABILITY FOR MEDIUM SYSTEMS IN FRANCE

	TIME IN HOURS			
	1981		1982	
SERVICE	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0.50-4.0	1.0	0.50-4.0	1.0
Actual	0.50-5.0	2.50	1.0-24.0	1.0
Minimum Acceptable	0.50-5.0	2.50	2.0-24.0	2.0
Repair Time				
Preferred	0.50-5.0	1.0	0.50-2.0	1.0
Actual	0.50-5.0	1.50	1.0-24.0	2.0
Maximum Acceptable	0.50-5.0	3.0	2.0	2.0

EXHIBIT C-24

USERS' PERCEPTION OF SERVICEABILITY FOR SMALL SYSTEMS IN FRANCE

| | TIME IN HOURS | | | |
| | 1981 | | 1982 | |
SERVICE	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0.50-5.0	2.0	1.0-2.0	2.0
Actual	0.50-5.0	3.0	3.0-4.0	3.0
Minimum Acceptable	0.50-5.0	3.50	4.0-8.0	4.0
Repair Time				
Preferred	0.50-5.0	1.0	2.0-2.0	2.0
Actual	0.50-5.0	2.50	2.0-4.0	2.0
Maximum Acceptable	0.50-5.0	2.75	4.0-8.0	4.0

INPUT
FAE2

EXHIBIT C-25

USERS' PERCEPTION OF SERVICEABILITY FOR OTHER MINICOMPUTERS
IN FRANCE

	TIME IN HOURS			
	1981		1982	
SERVICE	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0.25-4.50	1.50	1.0-8.0	2.0
Actual	0.50-5.0	2.0	1.0-29.0	7.0
Minimum Acceptable	0.25-5.0	3.50	2.0-9.0	3.0
Repair Time				
Preferred	0.50-4.50	1.0	1.0-8.0	2.0
Actual	0.50-4.75	2.0	1.0-28.0	5.0
Maximum Acceptable	0.50-5.0	2.50	2.0-8.0	2.0

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EXHIBIT C-26

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USERS' PERCEPTION OF SERVICEABILITY FOR PERIPHERALS
IN FRANCE

| | TIME IN HOURS | | | |
| | 1981 | | 1982 | |
SERVICE	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0.50-3.50	1.0	1.0-48.0	2.0
Actual	0.50-5.0	2.50	0.50-24.0	2.0
Minimum Acceptable	0.50-5.0	3.0	2.0-48.0	2.0
Repair Time				
Preferred	0.50-4.0	1.0	0.50-15.0	4.0
Actual	0.50-5.0	2.50	0.50-24.0	4.0
Maximum Acceptable	0.50-5.0	3.50	2.0-24.0	2.0

INPUT
FAE2

EXHIBIT C-27

USERS' PERCEPTION OF SERVICEABILITY FOR TERMINALS IN FRANCE

	TIME IN HOURS			
	1981		1982	
SERVICE	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0.50-5.0	1.75	2.0-24.0	4.0
Actual	0.50-5.0	2.50	2.0-48.0	4.0
Minimum Acceptable	0.50-5.0	3.0	2.0-36.0	3.0
Repair Time				
Preferred	0.50-4.0	0.75	0.50-2.0	1.0
Actual	0.50-5.0	1.50	0.50-120.0	4.0
Maximum Acceptable	0.50-5.0	3.0	2.0-24.0	2.0

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FAE2

EXHIBIT C-28

USERS' PERCEPTION OF SERVICEABILITY FOR WORD PROCESSORS
IN FRANCE

| | TIME IN HOURS | | | |
| | 1981 | | 1982 | |
SERVICE	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0.50-10.0	2.0	4.0-24.0	4.0
Actual	0.50-10.0	5.0	4.0-24.0	8.0
Minimum Acceptable	2.0-10.0	5.0	4.0-12.0	8.0
Repair Time				
Preferred	0.50-5.0	1.0	0.50-2.0	4.0
Actual	0.50-5.0	2.0	0.50-120.0	8.0
Maximum Acceptable	0.50-5.0	2.50	2.0-24.0	4.0

INPUT
FAE2

EXHIBIT C-29

USERS' PERCEPTION OF SERVICEABILITY FOR SOFTWARE IN FRANCE

	TIME IN HOURS			
	1981		1982	
SERVICE	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	1.0-10.0	6.0	1.0-24.0	2.0
Actual	1.50-10.0	10.0	1.0-24.0	4.0
Minimum Acceptable	2.0-10.0	9.0	1.0-24.0	2.0
Repair Time				
Preferred	1.0-10.0	2.0	1.0-4.0	1.0
Actual	1.50-10.0	5.0	1.0-48.0	3.0
Maximum Acceptable	1.50-10.0	5.50	2.0-20.0	2.0

EXHIBIT C-30

FRENCH RESPONDENTS' VIEWS OF SYSTEM AVAILABILITY

SYSTEM AVAILABILITY (percent) CLASSIFICATION	CURRENTLY GETTING		IDEALLY WOULD LIKE		MINIMUM WOULD ACCEPT	
	1981	1982	1981	1982	1981	1982
Large Mainframe Systems	95.1%	97.0%	98.8%	99.4%	94.2%	96.6%
Medium Mainframe Systems	97.2	96.1	99.1	98.3	95.7	85.2
Small Business Systems	93.0	96.2	97.5	98.7	95.0	95.3
Other Minicomputers	94.1	94.6	99.1	98.8	94.5	88.8
Peripherals	93.4	83.8	98.4	88.0	95.0	83.4
Terminals	98.7	92.4	99.5	88.3	97.0	85.6
Word Processors	95.6	91.3	99.0	96.3	96.0	95.3
Systems Software	90.8	95.5	98.8	98.7	95.0	95.6
Applications Software	93.8	96.0	99.0	98.7	96.0	97.7

INPUT
FAE2P104

EXHIBIT C-31

RESPONDENTS' PRICE INCREASES AND
FORECASTS IN FRANCE

SYSTEM AVAILABILITY (percent) CLASSIFICATION	PERCENT INCREASE IN LAST 12 MONTHS		FORECAST INCREASE EXPECTED IN NEXT 12 MONTHS		PERCENT INCREASE THAT WOULD BE UNACCEPTABLE	
	1981	1982	1981	1982	1981	1982
Large Mainframe Systems	10.5%	11.0%	8.4%	10.2%	12.6%	12.0%
Medium Mainframe Systems	11.8	8.6	10.2	9.2	13.4	13.9
Small Business Systems	8.8	16.0	8.9	13.5	12.1	18.3
Other Minicomputers	8.1	11.5	7.6	10.7	11.4	10.0
Peripherals	10.6	9.5	6.8	10.0	9.4	13.0
Terminals	8.6	8.5	8.4	7.8	12.8	11.8
Word Processors	7.4	6.7	6.3	10.7	10.3	9.0
Systems Software	9.3	8.0	7.1	6.5	11.7	14.5
Applications Software	11.3	8.0	11.2	8.0	14.1	10.0

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FAE2

EXHIBIT C-32

RESPONDENTS' AVERAGE CONTRACTED MAINTENANCE PERIOD VERSUS

ACTUAL EQUIPMENT USAGE, 1981 AND 1982, IN FRANCE

MAINTENANCE PERIOD AND EQUIPMENT USAGE	LARGE MAINFRAME SYSTEMS		MEDIUM MAINFRAME SYSTEMS		SMALL BUSINESS SYSTEMS		OTHER MINICOMPUTERS		PERIPHERALS		TERMINALS		WORD PROCESSORS	
	1981	1982	1981	1982	1981	1982	1981	1982	1981	1982	1981	1982	1981	1982
Contracted Maintenance (Number of Shifts)	2.1	1.3	1.7	1.3	1.2	1.0	1.2	1.0	1.8	1.3	1.1	1.0	1.1	1.0
Equipment Usage (Number of Shifts)	2.3	2.3	2.1	2.3	1.5	1.5	1.6	1.5	1.7	2.3	2.2	1.3	1.3	1.0
Contracted Maintenance Shifts Forecast Next Year (Number of Shifts)	2.2	1.3	1.8	1.3	1.6	1.0	1.2	1.0	1.9	1.3	1.2	1.0	1.1	1.0
Forecast Equipment Usage Next Year (Number of Shifts)	2.8	2.5	2.3	2.3	1.9	1.5	1.8	1.5	2.2	2.7	1.5	2.3	1.6	1.0
Contracted Number of Days per Week	5.1	4.0	5.3	3.4	5.1	5.0	5.2	5.0	5.2	3.6	5.4	3.8	5.0	5.0
Actual Usage (Days per Week)	5.8	5.4	5.4	5.2	5.2	5.0	5.3	4.2	5.5	4.9	5.5	4.6	5.1	5.3
Contracted Number of Days per Week Next Year	5.4	4.0	5.5	3.4	5.0	5.0	5.0	5.0	5.5	3.6	5.5	3.8	5.4	5.0
Forecast Usage (Days per Week) Next Year	5.8	5.4	6.4	5.2	5.9	5.0	5.1	4.2	5.7	5.1	5.6	5.1	5.5	5.3

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FAE2P106

EXHIBIT C-33

USERS' RATING OF IMPORTANCE OF
MAINTENANCE ISSUES IN FRANCE

MAINTENANCE ISSUES	ASKED IN 1981		ASKED IN 1982	
	1981	1983	1982	1984
System Availability	9.2	9.6	8.8	9.5
Response Time	8.3	9.2	7.8	8.9
Repair Time	6.9	7.3	8.1	8.5
Preventive Maintenance	6.6	5.9	4.4	4.8
Remote Maintenance	5.0	5.0	4.8	6.9
Escalation Procedures	5.9	5.9	6.7	7.8
Price of Maintenance	8.9	9.2	7.2	7.7
Stable Engineer Population	6.6	6.6	6.1	5.9
Uptime Guarantees	6.9	7.6	7.5	8.2
Equipment Reliability	9.2	9.6	9.1	8.9
Support Centres	6.3	6.9	5.7	6.9
Software Maintenance	6.9	8.9	7.4	8.2
Flexible Contract	5.9	6.3	5.6	6.5
User Self-Maintenance	6.6	6.6	5.1	7.1

1 = Unimportant
5 = Average
10 = Important

INP
FAE2

APPENDIX D: BENELUX, SCANDINAVIAN, AND
ITALIAN USER DATABASES

APPENDIX D: BENELUX, SCANDINAVIAN, AND ITALIAN USER DATABASES

A.   BENELUX USERS

1.   COMPARISON: 1982 VERSUS 1981

- INPUT's assessment of the Benelux users in 1981 and 1982 indicates stability in opinions and attitudes regarding maintenance and maintenance vendors. Few significant variations were detected, comparing 1982 data to 1981 data.

    - A notable change is Benelux users' tolerance to maintenance price increases.

        - They are willing to accept a slightly higher increase this year compared to last, when other users are hoping to see the amount of increase shrink.

        - The absence of competitive maintenance alternatives supports this attitude.

    - Benelux users are also willing to accept longer average response times, mainly because actual response and repair times have improved.

    - Subjective ratings of significant maintenance issues showed a trend of less concern over service in 1982 than in 1981.

INPUT

.   Among the issues of lesser importance to the user were: escalation procedures, stable engineering work force, response time, and pricing.

.   Issues gaining in the Benelux users' opinion included: system centres, system availability, support centres, and user self-maintenance.

2.   KEY SERVICE ISSUES

●   Users' candid reactions or comments to key service issues are summarised in Exhibit D-I.

-       Vendor maintenance dominates this area and, without competition, the absence of any maintenance price discounts is not unusual.

-       The potential for third-party maintenance is good, as most users perceive it as being unavailable rather than objectionable.

-       Maintenance cost evaluation is primarily determined from hardware cost relationships and performance.

-       Views are positive regarding preventive maintenance and remote diagnostics.

-       Annoyances concerning maintenance are not unusual, including the fact that there is any necessity for service.

●   Vendors should be sensitive to the vulnerability of the Benelux market for alternative or competitive maintenance resources.

INP

EXHIBIT D-1

USER CONSENSUS REGARDING KEY SERVICE ISSUES FOR BENELUX

CONCERN	USER REPLY
Guidelines for Evaluating Cost of Maintenance	'Contract cost and cost of overtime', '8-9% of purchase price', 'IBM guidelines', 'cost of outage', 'availability uptime', 'performance', 'no guidelines', 'self maintenance', 'none'.
Attitude Toward Preventive Maintenance	56% are positive about PM, 19% are negative, and 25% are uncertain.
Users Receiving Maintenance Price Discount	None of the Benelux respondents receives maintenance price discounts.
Attitude Towards Remote Diagnostics	59% are positively inclined about remote diagnostics.
Considering Third-Party Maintenance	All but 6% of the Benelux respondents are not considering third-party maintenance because it is unavailable, unknown, or not perceived as being an advantage.
Annoyances Regarding Maintenance	'Delays', 'bound to supplier', 'trial and error diagnostics', 'it's a necessity', 'disagreements between hardware and software engineers', 'ongoing faults' (repetitive).

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3.   SATISFACTION WITH MAINTENANCE AND SERVICEABILITY

- Benelux users are satisfied with the service they receive and feel that there has been a slight overall improvement in quality of maintenance, as shown in Exhibit D-2.

    - Ratings by users in 1982 do not vary appreciably with those of 1981.

    - Perceived enhancements are seen in five out of the eight topics.

    - Spare parts availability and quality of information are the most notable improvements.

- Exhibit D-3 compares trends in response times and mean time to repair as perceived by users.

    - Actual response times have improved slightly, as have repair times.

    - These improvements are responsible for users relaxing the range of minimum acceptable responsiveness.

4.   SYSTEM AVAILABILITY, PRICES, AND MAINTENANCE ISSUES

- System availability is important to Benelux users, as shown in Exhibit D-4.

    - Users are receiving availability from their systems which falls between minimum and maximum expectations.

        - The actual system availability, as perceived by users, ranges from 90.4% to 98.8% depending on equipment classification.

        - Ideal expectations vary from 97% to 100%.

INPUT

EXHIBIT D-2

USER SATISFACTION WITH MAINTENANCE OF
ALL SYSTEMS IN BENELUX

	Rating
Overall Quality of Maintenance	6.8 / 7.1
Quality of Engineers	6.8 / 6.9
Quality of Engineers' Managers	6.4 / 6.6
Availability of Spare Parts	6.0 / 6.8
Quality of Information	5.0 / 5.7
Remote Diagnostics	5.6 / 5.3
Forecast of Quality of Maintenance Next Year	7.0 / 6.3
Value for Money of Maintenance	6.2 / 6.1

☐ = 1981

▨ = 1982

1 = Poor

5 = Average

10 = Excellent

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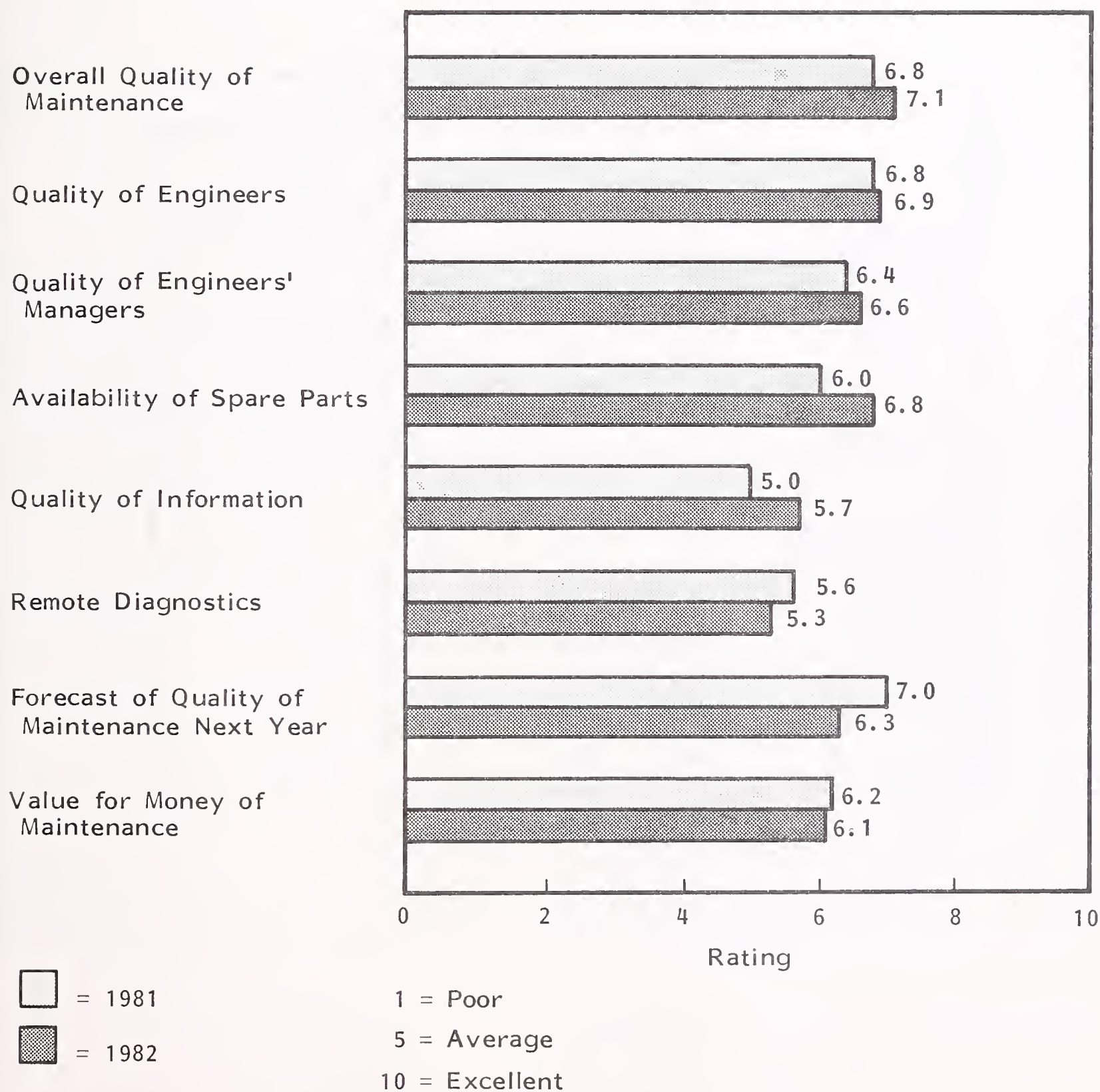
EXHIBIT D-3

USERS' PERCEPTION OF SERVICEABILITY FOR
ALL SYSTEMS IN BENELUX

| | TIME IN HOURS | | | |
| | 1981 | | 1982 | |
SERVICE	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0-8.0	1.0	0.25-4.0	1.0
Actual	0-36.0	2.0	0.25-8.0	2.0
Minimum Acceptable	0-24.0	2.2	0.25-120.0	4.0
Repair Time				
Preferred	0-2.8	0.8	0.50-36.0	1.0
Actual	0-3.5	1.8	0.25-4.0	1.0
Maximum Acceptable	0.3-4.0	2.0	0.50-120.0	2.0

INPUT
FAE2

BENELUX RESPONDENTS' VIEW OF SYSTEM AVAILABILITY

SYSTEM AVAILABILITY (percent)	CURRENTLY GETTING		IDEALLY WOULD LIKE		MINIMUM WOULD ACCEPT	
CLASSIFICATION	1981	1982	1981	1982	1981	1982
Large Mainframe Systems	97.7%	96.6%	99.1%	99.7%	95.1%	95.4%
Medium Mainframe Systems	96.8	90.4	98.7	97.7	94.7	91.4
Small Business Systems	92.0	96.7	97.1	99.4	93.4	93.4
Other Minicomputers	95.4	97.2	98.8	100.0	95.2	95.4
Peripherals	97.4	96.8	99.0	99.3	95.3	94.8
Terminals	97.1	96.0	98.7	99.7	94.6	94.5
Word Processors	93.2	98.8	98.1	100.0	95.1	93.0
Systems Software	98.1	96.4	99.2	98.7	98.0	94.5
Applications Software	94.0	96.3	98.4	97.0	94.9	86.3

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FAE2 P123

- Minimum standards range from 86.3% to 95.4%.

- Overall average system availability improved slightly from 95.7% in 1981 to 96.1% in 1982.

- Exhibit D-5 provides user-perceived pricing data.

  - Users believe they had an average maintenance price increase of 5.6% in 1982 compared to a 6.3% increase in 1981.

  - They expected a 6.2% increase in 1982 and believe that 1982-1983 increases will be about 5.7%.

  - The threshold of unacceptable price increases was at 8.5% in 1981 and is 8.7% in 1982.

o Maintenance issues, as rated by users, appear in Exhibit D-6.

B.   SCANDINAVIAN USERS

1.   COMPARISON: 1982 VERSUS 1981

- Scandinavian users express an appreciable improvement in their satisfaction with service in 1982 compared to 1981.

  - Use of remote diagnostics improved 84%.

  - Spare parts availability increased by 34%.

  - Quality of engineers' managers and engineers rose 28% and 15% respectively.

INPUT

RESPONDENTS' PRICE INCREASES AND
FORECASTS IN BENELUX

CLASSIFICATION	PERCENT INCREASE IN LAST 12 MONTHS		FORECAST INCREASE EXPECTED IN NEXT 12 MONTHS		PERCENT INCREASE THAT WOULD BE UNACCEPTABLE	
	1981	1982	1981	1982	1981	1982
Large Mainframe Systems	4.8%	6.6%	4.5%	7.4%	7.5%	9.2%
Medium Mainframe Systems	6.2	6.0	5.0	3.8	7.5	7.5
Small Business Systems	7.1	6.9	10.5	7.4	12.0	10.0
Other Minicomputers	6.9	4.3	6.5	6.0	8.0	9.0
Peripherals	5.4	5.4	5.4	5.2	7.5	8.0
Terminals	7.2	4.6	6.0	4.4	9.0	9.2
Word Processors	No Mentions	3.4	6.0	4.5	7.5	10.0
Systems Software	4.8	6.2	5.0	6.3	8.4	10.0
Applications Software	8.2	7.0	6.5	6.0	9.2	5.5

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FAE2P124

USERS' RATING OF IMPORTANCE OF
MAINTENANCE ISSUES IN BENELUX

MAINTENANCE ISSUES	ASKED IN 1981		ASKED IN 1982	
	1981	1983	1982	1984
System Availability	8.3	8.9	9.5	9.6
Response Time	9.2	9.2	8.1	8.6
Repair Time	8.6	8.9	7.9	8.1
Preventive Maintenance	6.9	5.9	6.8	6.6
Remote Maintenance	5.6	6.9	4.8	5.3
Escalation Procedures	7.3	7.3	6.3	6.5
Price of Maintenance	8.9	8.9	5.9	6.5
Stable Engineer Population	8.3	6.9	5.4	5.4
Uptime Guarantees	5.9	7.6	7.0	7.5
Equipment Reliability	8.6	8.6	9.2	9.2
Support Centres	5.0	5.0	6.7	7.0
Software Maintenance	7.6	8.3	7.9	8.0
Flexible Contract	6.3	6.3	5.8	6.4
User Self-Maintenance	3.6	5.0	5.1	5.8

1 = Unimportant
5 = Average
10 = Important

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FAE2P

- Overall quality of maintenance improved 10%.

• Minimum acceptable response times relaxed slightly due to a small improvement in repair time.

2. GENERAL ASSESSMENT

• Scandinavian users are receiving satisfactory service, as noted in Exhibit D-7.

- Significant improvements as noted above, are creating a positive vendor image.

• Feedback relating to key service issues, as shown in Exhibit D-8, signals the need for vendor focus on service strategies.

- One enterprising user has cancelled his maintenance contract and has taken out an insurance policy.

  . He believes he will save money.

  . This idea has also been recently implemented in the U.K.

- Very little maintenance discounting is perceived.

- Over half the users don't consider third-party maintenance because they don't think it is available.

- Positive attitudes exist for use of remote diagnostics and preventive maintenance.

- Grievances towards service are normal.

• Serviceability and response and repair times are shown in Exhibit D-9, and indicate normal response and repair intervals are at two hours.

INPUT

USER SATISFACTION WITH MAINTENANCE OF
ALL SYSTEMS IN SCANDINAVIA

Overall Quality of Maintenance — 6.4 (1981), 7.1 (1982)

Quality of Engineers — 6.8 (1981), 7.8 (1982)

Quality of Engineers' Managers — 5.8 (1981), 7.4 (1982)

Availability of Spare Parts — 6.4 (1981), 8.6 (1982)

Quality of Information — 6.4 (1981), 6.1 (1982)

Remote Diagnostics — 3.8 (1981), 7.0 (1982)

Forecast of Quality of Maintenance Next Year — 7.2 (1981), 7.2 (1982)

Value for Money of Maintenance — 6.2 (1981), 5.9 (1982)

Rating

☐ = 1981

▨ = 1982

1 = Poor

5 = Average

10 = Excellent

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FAE2P1

USER CONSENSUS REGARDING KEY SERVICE ISSUES FOR SCANDINAVIA

CONCERN	USER REPLY
Guidelines for Evaluating Cost of Maintenance	'We have equipment without contracts and use insurance to prevent costs', 'compare pricing with other users', 'must pay – no competition', 'intuition', 'competition'.
Attitude Toward Preventive Maintenance	100% are very favorable toward PM and believe PM is important for system uptime.
Users Receiving Maintenance Price Discount	Only 6% of Scandinavian users receive a maintenance discount.
Attitude Toward Remote Diagnostics	20% are negatively inclined, stating as reasons: security and 'doesn't work and takes too long'. Positive respondents like remote diagnostics because it is a cost saver and provides more system availability.
Considering Third-Party Maintenance	44% replied negatively toward TPM. 'Tried it – not satisfied', 'no – very satisfied with vendor'. 56% indicated it was not available.
Annoyances Regarding Maintenance	'High costs', 'lack of remote diagnostics', 'frequency of maintenance needs', 'can't get through or phone', 'problem of multiple supplier', 'response time', 'very expensive – especially on old machines'.

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FAE2P128

EXHIBIT D-9

USERS' PERCEPTION OF SERVICEABILITY FOR
ALL SYSTEMS IN SCANDINAVIA

| | TIME IN HOURS | | | |
| | 1981 | | 1982 | |
SERVICE	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	0-4.5	1.0	0.5-8	2.1
Actual	0-24.0	2.0	0.5-24	2.0
Minimum Acceptable	0-24.0	2.0	1.0-40	4.0
Repair Time				
Preferred	0-48.0	1.0	0.5-4	1.7
Actual	0-48.0	2.5	0.3-24	2.0
Maximum Acceptable	0-48.0	2.5	1-80	3.7

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INPUT
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- System availability is important, as shown in Exhibit D-10.

    - The average availability degraded slightly from 96.5% in 1981 to 95% in 1982.

    - System availability for all classes of equipment except small business systems and peripherals is acceptable, falling between users' minimum and maximum tolerances.

    - Systems software, however, falls below minimum expected levels.

C.   ITALIAN USERS

- The Italian market for maintenance was added in 1982, and since it is new there are no comparisons to 1981 research.

- Italian users rate their satisfaction with service above average, overall, as shown in Exhibit D-11.

- Reactions to key service issues, Exhibit D-12, reveal that users' perceptions of remote diagnostics are disproportionately negative.

    - Vendors should work on improving this through regular contacts with users and sharpened skills in diagnostics.

    - Twenty-five percent of Italian users receive a discount, and since only half are negatively inclined towards third-party maintenance, a competitive market for service is suggested.

- Exhibit D-13 describes users' views of serviceability in terms of:

INPUT

SCANDINAVIAN RESPONDENTS' VIEWS OF SYSTEM AVAILABILITY

SYSTEM AVAILABILITY (percent) CLASSIFICATION	CURRENTLY GETTING		IDEALLY WOULD LIKE		MINIMUM WOULD ACCEPT	
	1981	1982	1981	1982	1981	1982
Large Mainframe Systems	98.1%	93.5%	99.2%	97.8%	96.0%	92.3%
Medium Mainframe Systems	97.4	98.8	99.1	99.6	95.5	96.6
Small Business Systems	96.0	88.2	98.7	96.0	95.0	95.0
Other Minicomputers	97.0	97.3	99.0	99.0	96.4	94.0
Peripherals	98.1	90.8	99.1	97.7	95.8	93.8
Terminals	96.8	97.9	97.8	97.9	94.2	95.0
Word Processors	94.4	97.7	96.0	99.0	94.6	96.7
Systems Software	97.8	96.4	99.2	99.5	97.0	97.2
Applications Software	92.9	94.3	98.9	99.5	96.1	98.7

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FAE2P 0

USER SATISFACTION WITH MAINTENANCE OF ALL SYSTEMS
IN ITALY, 1982

Overall Quality of Maintenance — 7.0

Quality of Engineers — 7.3

Quality of Engineers' Managers — 6.6

Availability of Spare Parts — 7.4

Quality of Information — 5.9

Remote Diagnostics — 5.2

Forecast of Quality of Maintenance Next Year — 7.2

Value for Money of Maintenance — 5.6

Rating

0   2   4   6   8   10

1 = Poor

5 = Average

10 = Excellent

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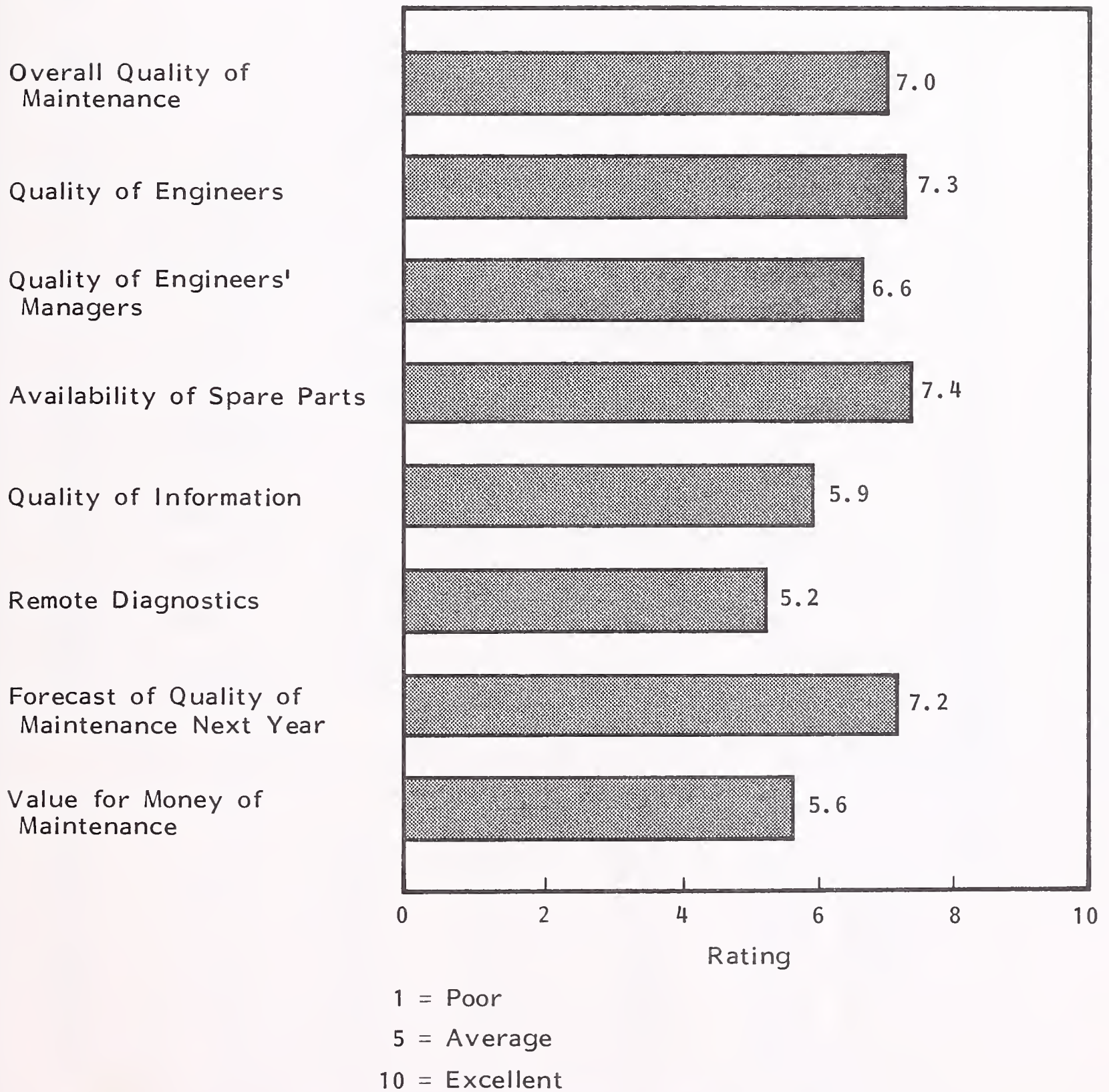
EXHIBIT D-12

USER CONSENSUS REGARDING KEY SERVICE ISSUES FOR ITALY

CONCERN	USER REPLY
Guidelines for Evaluating Cost of Maintenance	'Repair time', 'equipment reliability', 'relationship to uptime', 'hardware performance'.
Attitude Toward Preventive Maintenance	'Not interesting'. 'We do it'. 'We need it'.
Users Receiving Maintenance Price Discount	25% receive a discount.
Attitude Towards Remote Diagnostics	Half of Italian user respondents are negatively inclined toward remote diagnostics.
Considering Third-Party Maintenance	Half do not want third-party maintenance. Half do not know about it.
Annoyances Regarding Maintenance	'Delays and incompetence of newly trained staff', 'high cost', 'very satisfied'.

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USERS' PERCEPTION OF SERVICEABILITY FOR ALL SYSTEMS IN ITALY

SERVICE	TIME IN HOURS			
	1981		1982	
	RANGE	MEDIAN	RANGE	MEDIAN
Response Time				
Preferred	No Mentions	No Mentions	0.30-24.0	3.7
Actual			0.50-110.0	4.2
Minimum Acceptable			1.0-150.0	4.0
Repair Time				
Preferred			0.30-6.0	1.30
Actual			0.50-24.0	3.30
Maximum Acceptable			1.0-36.0	3.30

INPUT
FAE2

- Response time.

- Repair time.

- System availability ranks high, 10, on the Italian users' assessment of mainte-
  nance in 1984, as shown in Exhibit D-14.

  - This is corroborated by the high expectations for systems availability
    shown in Exhibit D-15.

  - Perceived availability, overall at 89.9%, falls short of mimimum user
    standards, 90.6%, indicating another chore for vendors to concentrate
    on.

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USERS' RATING OF IMPORTANCE OF MAINTENANCE ISSUES
IN ITALY

MAINTENANCE ISSUES	ASKED IN 1982	
	1982	1984
System Availability	7.6	10
Response Time	8.3	7.5
Repair Time	8.7	7.8
Preventive Maintenance	4.9	5.2
Remote Maintenance	4.0	8.2
Escalation Procedures	4.6	9.8
Price of Maintenance	7.3	8.0
Stable Engineer Population	6.8	6.8
Uptime Guarantees	7.0	8.3
Equipment Guarantees	8.7	9.8
Support Centres	7.0	8.7
Software Maintenance	7.6	9.3
Flexible Contract	6.1	8.0
User Self-Maintenance	4.3	5.3

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FAE2

ITALIAN RESPONDENTS' VIEWS OF SYSTEM AVAILABILITY

CLASSIFICATION	CURRENTLY GETTING 1982	IDEALLY WOULD LIKE 1982	MINIMUM WOULD ACCEPT 1982
Large Mainframe Systems	99.3%	99.0%	98.0%
Medium Mainframe Systems	86.5	98.5	95.5
Small Business Systems	80.0	100.0	60.0
Other Minicomputers	96.9	99.0	94.5
Peripherals	90.0	99.0	95.0
Terminals	91.7	99.2	87.2
Word Processors	No Mentions		
Systems Software	85.0	99.5	97.3
Applications Software	90.0	99.5	97.3

INPUT
FAE2

APPENDIX E: QUESTIONNAIRE

FIELD SERVICE VENDOR SURVEY 1982

1. STAFFING LEVELS	1982	1983
Employees in company		
Number in field service		
Number of field engineers		
Number of technical support engineers		
Number of field service administrators		
Number of field service supervisors		
Number of field service line managers		

2. ORGANIZATION	1982	1983
Number of branch offices		
Number of sites with resident engineer		
Number of sites using remote diagnostics		
Number of spares holding centers		
Percent of staff at headquarters		
Percent of staff on training courses		
Percent of engineers working from home		

3. FINANCIAL	1982	1983
Field service revenue		
Field service budget		
Profit percentage before tax	%	%
Revenue per engineer		
Fully burdened cost of engineer		
Charge out hourly rate for engineer		
Percent field service revenue of total company revenue		

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INPUT

4. SALARY INFORMATION	DOLLAR RANGE		AVERAGE SALARY	PERCENT INCREASE		TRAINING INVESTMENT VALUE
	FROM	TO		1981	1982	
Trainee						
Qualified Field Engineer						
Senior Field Engineer						
Hardware Support Engineer						
Software Support Engineer						
Supervisor						
Line Manager						

5. DISTRIBUTION BY ENVIRONMENT

EQUIPMENT CATEGORY	PERCENT DP ROOM	PERCENT OFFICE	PERCENT PLANT / FACTORY
Mainframe Systems			
Small Business Systems			
Minicomputers			
Microcomputers			
Word Processors			
Executive Workstation			
Peripherals			
Terminals			
Data Communications			

6. COST BREAKDOWN OF A TYPICAL FAULT CALL

COMPONENT	1982	1983
Average Cost ($)		
Direct Labor (Percent)		
Travel Labor (Percent)		
Parts and Material (Percent)		
Travel Expense (Percent)		
Burden and Overhead (Percent)		
Average Number of Calls Per Week/ Per Engineer		

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7. How do you set your maintenance charges (e.g., percent of sales value, based on costs, etc.)?

_____

_____

_____

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8. LABOR TURNOVER	1981	1982
Number of Field Engineers Lost		
Number of Field Engineers Gained		

9. What are the major reasons for losing engineers?

_____

_____

_____

10. Please rate the following in terms of the amount of field service management attention paid to them in 1981, and your plans for 1982 in this regard (1 = Low, 10 = High)

AREA	1981 RATING	1982 RATING
● System Availability		
● Response Time		
● Repair Time		
● Preventive Maintenance		
● Remote Maintenance		
● Escalation Procedure		
● Price of Maintenance		
● Stability of Engineer Population		
● Uptime Guarantees		
● Equipment Reliability		
● Support Centers		
● Software Maintenance		
● Flexible Contracts		
● User Self-Maintenance		
● Other _____		
● Other _____		

INPUT

11. Please rate your success at implementing the following during 1981: 1 = Low, 10 = High P = Planned, I = Implemented/no data N = Not implemented	RATING
Recruiting of Field Service Engineers	
Training of Field Service Engineers	
Reducing Labor Turnover	
Improving Product Quality	
Making Adequate Diagnostic Equipment Available	
Providing Adequate Remote Diagnostic Assistance	
Meeting Customer Demands	
Living with Budget Limitations	
Providing Competitive Salary/Compensation	
Reducing Spare Parts Shortages	
Improving FE Technical Competence	
Marketing Field Service	
Maintenance Through Distributors	
Maintenance of Data Communications Equipment	

12. Please rate the field service involvement and influence in the following issues. 1 = Low 10 = High	1981	1982
Equipment Specification		
Equipment Design		
Equipment Serviceability Design		
Built-in Diagnostics		
Other Diagnostics		
Selection of Test Equipment		
Spares Requirements and Levels		
Geographic Marketing Control		
Order Acceptance Sign-Off		
Contractual Terms and Conditions		
Acceptability of Site Environment		
User Education		
Selling of Field Service		
Pricing of Field Service		

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13. MAINTENANCE PRICING

EQUIPMENT CATEGORY	PURCHASE VALUE OF YOUR EQUIPMENT	MONTHLY MAINTENANCE CHARGE	CONTRACT RESPONSE TIME	CONTRACT PERIOD OF NOTICE OF INCREASE	PERCENT INCREASE IN LAST 12 MONTHS	FORECAST INCREASE EXPECTED IN NEXT 12 MONTHS	PERCENT INCREASE THAT WOULD BE UNACCEPTABLE	T&M HOURLY CHARGE FOR AN ENGINEER
Large Mainframe Systems								
Medium Mainframe Systems								
Small Business Systems								
Minicomputers								
Microcomputers								
Peripherals								
Terminals								
Word Processors								
Executive Workstation								
Data Communications								
Systems Software								
Applications Software								

INPUT

14. FIELD SERVICE PERFORMANCE

EQUIPMENT CATEGORY	SYSTEM AVAILABILITY (PERCENT)			MAINTENANCE AVERAGE RESPONSE TIME IN HOURS			MAINTENANCE AVERAGE REPAIR TIME IN HOURS			AVERAGE MEAN TIME BETWEEN FAILURES (HOURS)	NUMBER OF NO FAULT FOUND (PERCENT)	NUMBER OF REPEAT CALLS (PERCENT)
	CURRENT	ESTIMATE IN 1983	MINIMUM YOUR USER WOULD ACCEPT	CURRENT	WHAT DOES YOUR USER EXPECT	WHAT DO YOU HOPE TO ACHIEVE IN 1983	CURRENT	YOUR ESTIMATE FOR 1983	AFTER WHAT TIME DOES ENGINEER CALL FOR ASSISTANCE			
Large Mainframe Systems												
Medium Mainframe Systems												
Small Business Systems												
Minicomputers												
Microcomputers												
Peripherals												
Terminals												
Word Processors												
Executive Workstation												
Data Communications												
Systems Software												
Applications Software												

INPUT

15. Do your field service revenues include revenues from the following?
    (☑ or percent if possible)

    ☐ Hardware maintenance   ☐ Systems software maintenance

    ☐ Applications software   ☐ Training/documentation
        maintenance
                                           ☐ Equipment relocation
    ☐ Installation fees

    ☐ Spares   ☐ Supplies (e.g., ribbons, disk
                                             packs, etc.)

    ☐ Credits from sales for special maintenance conditions.

    ☐ Other (please specify) _____

16. Do you operate field service P & L control at ☐ branch, ☐ district, ☐ regional, ☐ headquarters level, or ☐ cost/budget control?

17. Can you quantify the benefits versus costs of the principal new field service programs? (e.g., Remote Diagnostics, Support Centers, Automated Dispatch, etc.)

    _____

    _____

    _____

    _____

    _____

18. What key indicators or measurement techniques are used to control CE/ first line managers?

    _____

    _____

19. Do you offer reductions in standard maintenance contract prices for different delivery modes?

	YES	NO	PERCENT
Carry in/mail in:	☐	☐	☐
User self-maintenance:	☐	☐	☐
Device swap-out:	☐	☐	☐
Other (_____):	☐	☐	☐
Other (_____):	☐	☐	☐

INPUT

20. To what level do you track costs and revenues?

☐ Site ☐ Customer ☐ Product ☐ Product line ☐ Other _____

21. With regard to spare parts, do you:

☐ Expense low-cost parts (less than $_____)?

☐ Inventory parts over $_____?

22. What life expectancy do you apply to spares?

_____

23. Who is responsible for marketing and sales of field service products and contracts?

☐ Field service organization   ☐ Sales organization

☐ Both involved   ☐ Other (_____)

24. In your view what was the most significant field service issue or development in 1981 (i.e., in your organization and/or in other field service companies)?

_____

_____

_____

_____

25. What will be the most significant issue in the next 24 months? (as for 24)

_____

_____

_____

THANK YOU

The time you have spent with us is appreciated. If you would like to know more about INPUT's research programs and are not already a client, please check here ☐ .

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